Advant® OCS
with Master software

Application Builder

Version 2.7

User’s Guide

3BSE 007 031R701

Use of **DANGER**, **WARNING**, **CAUTION**, and **NOTE**

This publication includes, **DANGER**, **WARNING**, **CAUTION**, and **NOTE** information where appropriate to point out safety related or other important information.

DANGER	Hazards which could result in severe personal injury or death
WARNING	Hazards which could result in personal injury
CAUTION	Hazards which could result in equipment or property damage
NOTE	Alerts user to pertinent facts and conditions

Although **DANGER** and **WARNING** hazards are related to personal injury, and **CAUTION** hazards are associated with equipment or property damage, it should be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process performance leading to personal injury or death. Therefore, comply fully with all **DANGER**, **WARNING**, and **CAUTION** notices.

TRADEMARKS

ABB Master, MasterAid, MasterBus, MasterPiece, and MasterView are registered trademarks of ABB Asea Brown Boveri Ltd., Switzerland.

MasterGate, MasterFieldbus, and MasterNet are trademarks of ABB Asea Brown Boveri Ltd., Switzerland.

Advant, AdvaBuild, and AdvaInform are registered trademarks of ABB Asea Brown Boveri Ltd., Switzerland.

AdvaCommand, AdvaSoft, Advant Station, AdvaBuild On-line Builder, Advant Controller, and Advant Fieldbus are trademarks of ABB Asea Brown Boveri Ltd., Switzerland.

IBM and all IBM-products mentioned in this publication are registered trademarks of International Business Machines Corp.

Microsoft, MS-DOS, and Windows are registered trademarks, Windows NT is a trademark of Microsoft Corporation.

Adobe and Acrobat are trademarks of Adobe Systems Incorporated.

NOTICE

The information in this document is subject to change without notice and should not be construed as a commitment by ABB Automation Products GmbH. ABB Automation Products GmbH assumes no responsibility for any errors that may appear in this document.

In no event shall ABB Automation Products GmbH be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB Automation Products GmbH be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

This document and parts thereof must not be reproduced or copied without ABB Automation Products GmbH's written permission, and the contents thereof must not be imparted to a third party nor be used for any unauthorized purpose.

The software described in this document is furnished under a license and may be used, copied, or disclosed only in accordance with the terms of such license.

Copyright © ABB Automation Products GmbH 1999.

TABLE OF CONTENTS

Chapter 1 - Introduction

1.1 Before You Begin 1-1
1.2 Equipment Requirements 1-2
1.3 How to Use This Book 1-4
1.4 Conventions 1-5
1.5 Related Documentation 1-6
1.6 Release History 1-6
1.7 Terminology 1-7
1.8 Product Overview 1-8
  1.8.1 AMPL Control Configuration 1-8
  1.8.2 Function Overview 1-8
    1.8.2.1 Application Builder 1-8
    1.8.2.2 Function Chart Builder 1-10
    1.8.2.3 Bus Configuration Builder 1-12
    1.8.2.4 On-line Builder 1-12
    1.8.2.5 AS100-EDIT 1-14
    1.8.2.6 AMPL PC and DB Element Libraries 1-14
  1.8.3 Target System Configuration 1-15
1.9 User Interface 1-18

Chapter 2 - Installation

Chapter 3 - Configuration and Application Building

3.1 Considerations 3-1
3.2 Capacity and Performance 3-1
3.3 Application Start-up 3-1
3.4 Tutorial 3-1
3.5 Application Procedures 3-2
  3.5.1 Navigation 3-2
  3.5.2 Usage of Page Layout Templates 3-2
  3.5.3 Create an Object for Working with a Tool on It 3-4
  3.5.4 Open an Existing Object for Working with a Tool on It 3-4
  3.5.5 Working with Different Versions of Tools 3-4
  3.5.6 Upgrading/Changing Function Chart Builder Version 3-5
  3.5.7 Usage of AMPL PC and DB Element Libraries 3-6
  3.5.8 Locking 3-7
  3.5.9 Restrictions on Parallel Execution 3-7
  3.5.10 Converting Source Files 3-8

CONTENTS (continued)

3.5.11 Extracting PC Source Files 3-9
3.5.12 Copying Application Data 3-11
3.5.13 Application Retrieval 3-12
3.5.14 Using the Text Editor 3-13
3.5.15 Configuration Files 3-13
3.6 Configuration/Application Building Menus 3-14
3.6.1 Controls and Indicators 3-14
3.6.1.1 Controls in Title Bar 3-14
3.6.1.2 Controls in Toolbar 3-15
3.6.1.3 Indicators in Status Bar 3-15
3.6.2 Document Windows 3-16
3.6.2.1 Node List 3-16
3.6.2.2 Extended View - for Nodes 3-20
3.6.2.3 Circuit List 3-22
3.6.2.4 Extended View - for Circuits 3-25
3.6.2.5 Type Circuit List 3-27
3.6.2.6 Extended View - for Type Circuits 3-30
3.6.3 File Menu 3-31
3.6.3.1 File | New | Project 3-31
3.6.3.2 File | New | Node 3-33
3.6.3.3 More Settings Dialog 3-36
3.6.3.4 Select Tool Versions Dialog 3-37
3.6.3.5 Function Chart Builder Libraries Dialog 3-38
3.6.3.6 Edit Document Texts 3-39
3.6.3.7 File | New | Circuit 3-40
3.6.3.8 File | New | Type Circuit 3-42
3.6.3.9 File | Open | Project 3-44
3.6.3.10 File | Open | Node List 3-45
3.6.3.11 File | Open | Circuit List 3-45
3.6.3.12 File | Open | Type Circuit List 3-45
3.6.3.13 File | Copy - for Projects 3-46
3.6.3.14 File | Copy - for Nodes 3-48
3.6.3.15 Copy - Set Destination Name Dialog 3-50
3.6.3.16 File | Copy - for Circuits 3-51
3.6.3.17 File | Copy - for Type Circuits 3-53
3.6.3.18 File | Delete | Project 3-55
3.6.3.19 File | Delete | Selected 3-56
3.6.3.20 File | Lock/Unlock 3-56

CONTENTS (continued)

3.6.3.21 File | Modify - for Node 3-57
3.6.3.22 File | Modify - for Circuit/Type Circuit 3-60
3.6.3.23 File | Retrieve Application 3-62
3.6.3.24 File | Update FCB Data | Project 3-64
3.6.3.25 File | Update FCB Data | Selected 3-65
3.6.3.26 File | Convert 3-67
3.6.3.27 File | Extract 3-70
3.6.3.28 File | Split Source Code 3-72
3.6.3.29 File | Concatenate 3-73
3.6.3.30 File | Print 3-75
3.6.3.31 File | Print Preview 3-76
3.6.3.32 File | Page Setup 3-77
3.6.3.33 File | Project Notes 3-78
3.6.3.34 File | Close Project 3-78
3.6.3.35 File | Exit 3-78

3.6.4 View Menu 3-78
- 3.6.4.1 View | Extend 3-78
- 3.6.4.2 View | Used Versions 3-79
- 3.6.4.3 View | Update 3-79
- 3.6.4.4 View | Names Only 3-79
- 3.6.4.5 View | Toolbar 3-79
- 3.6.4.6 View | Status Bar 3-80

3.6.5 Options Menu 3-80
- 3.6.5.1 Options | Project Defaults 3-80
- 3.6.5.2 Options | Assign Double-click 3-82
- 3.6.5.3 Options | Preferences 3-83
- 3.6.5.4 Options | Confirmation 3-83

3.6.6 Tools Menu 3-84
- 3.6.6.1 Tools | Function Chart Builder 3-84
- 3.6.6.2 Tools | Node Structure Function Chart Builder 3-84
- 3.6.6.3 Tools | Bus Configuration Builder 3-84
- 3.6.6.4 Tools | On-line Builder 3-86
- 3.6.6.5 Tools | Text Editor 3-86

3.6.7 Window Menu 3-86
- 3.6.7.1 Window | Cascade 3-86
- 3.6.7.2 Window | Tile Horizontally 3-86
- 3.6.7.3 Window | Tile Vertically 3-87
- 3.6.7.4 Window | Arrange Icons 3-87

CONTENTS (continued)

3.6.7.5 Window | 1, 2, ... (Activate List Window) 3-87
3.6.8 Help Menu 3-87
3.6.8.1 Help | Contents 3-87
3.6.8.2 Help | On Context 3-87
3.6.8.3 Help | How to Use Help 3-88
3.6.8.4 Help | On Project 3-88
3.6.8.5 Help | Release Notes 3-89
3.6.8.6 Help | About Application Builder 3-89

Chapter 4 - Runtime Operation

4.1 Operating Overview 4-1
4.2 Runtime Tutorial 4-1
4.3 Operating Instructions 4-1
4.4 Runtime Operating Menus 4-1

Chapter 5 - Maintenance

5.1 Error Messages 5-1
5.2 Handling of Diskettes 5-1

Appendix A - National Characters

A.1 Introduction A-1
A.2 US/Default Character Set A-1
A.3 Swedish Character Set A-2
A.4 German Character Set A-3

Appendix B - Glossary

INDEX

ILLUSTRATIONS

Figure 1-1. Relationship Between the Different Tools 1-9
Figure 3-1. Handling of Page Layout Template Sets 3-3
Figure 3-2. Source Code Transfer Between Tools and Different Platforms 3-8
Figure 3-3. Toolbar 3-15
Figure 3-4. Status Bar 3-15
Figure 3-5. Node List 3-16
Figure 3-6. Node List - Names Only 3-17

ILLUSTRATIONS (continued)

Figure 3-7. Extended View Dialog for Nodes 3-20
Figure 3-8. Circuit List 3-22
Figure 3-9. Circuit List - Names Only 3-23
Figure 3-10. Extended View Dialog for Circuits 3-25
Figure 3-11. Circuit List 3-27
Figure 3-12. Type Circuit List - Names Only 3-28
Figure 3-13. Extended View Dialog for Type Circuits 3-30
Figure 3-14. New Project Dialog 3-31
Figure 3-15. New Node Dialog 3-33
Figure 3-16. More Settings Dialog 3-36
Figure 3-17. Select Tool Versions Dialog 3-37
Figure 3-18. Function Chart Builder Libraries Dialog 3-38
Figure 3-19. Edit Document Texts Dialog 3-39
Figure 3-20. New Circuit Dialog 3-40
Figure 3-21. New Type Circuit Dialog 3-42
Figure 3-22. Open Project Dialog 3-44
Figure 3-23. Copy Projects Dialog 3-46
Figure 3-24. Copy Nodes Dialog 3-48
Figure 3-25. Copy From... To... Dialog 3-50
Figure 3-26. Copy Circuits Dialog 3-51
Figure 3-27. Copy Type Circuits Dialog 3-53
Figure 3-28. Delete Project Dialog 3-55
Figure 3-29. Modify Node Dialog 3-57
Figure 3-30. Modify Circuit/Type Circuit Dialog 3-60
Figure 3-31. Retrieve Application Dialog 3-63
Figure 3-32. Update FCB Data for Project Dialog 3-65
Figure 3-33. Update FCB Data for Nodes Dialog 3-66
Figure 3-34. Convert Source Code Files Dialog 3-67
Figure 3-35. Replace All Warning Dialog 3-68
Figure 3-36. Replace One Warning Dialog 3-68
Figure 3-37. Extract and Convert PC Source Code Dialog 3-70
Figure 3-38. Replace One Warning Dialog 3-71
Figure 3-39. Split Source Code Dialog 3-72
Figure 3-40. Concatenate Dialog 3-74
Figure 3-41. Print Dialog 3-75
Figure 3-42. Print Preview Dialog 3-76
Figure 3-43. Page Setup Dialog 3-77
Figure 3-44. Used Versions Dialog 3-79

ILLUSTRATIONS (continued)

Figure 3-45. Set Defaults for the Project Dialog 3-80
Figure 3-46. Assign the Mouse Double-click Dialog 3-82
Figure 3-47. Preferences Dialog 3-83
Figure 3-48. Select Environment Dialog 3-85
Figure 3-49. On Project Dialog 3-88

TABLES

Table 1-1. Related Documentation 1-6
Table 1-2. Supported Target Versions 1-15
Table 1-3. Overview of Tool Access to Remote Advant Target Systems 1-17
Table 1-4. Overview of Tool Access to Remote Master Target Systems 1-18
Table 3-1. Extract, Example 1 3-10
Table 3-2. Extract, Example 2 3-10
Table 3-3. Extended View File Types for Nodes 3-20
Table 3-4. Extended View File Types for Circuits 3-26
Table 3-5. Extended View File Types for Type Circuits 3-30
Table A-1. Supported Swedish Characters A-2
Table A-2. Supported German Characters A-3

Chapter 1 Introduction

1.1 Before You Begin

Purpose

Application Builder is available for Windows NT 4.0. It is part of the product **AMPL Control Configuration**. The product represents the configuration software for Advant OCS running on Advant Station 100 Series Engineering Stations.

For this configuration the following Builders are available:

- Application Builder
  the basic software module to handle projects, nodes, circuits, and type circuits.
  It is a prerequisite for On-line Builder and for Function Chart Builder.
- On-line Builder
  for configuring and application configuration of Advant Controller 400 Series, MasterPiece 200/1, MasterPiece 51, MasterGate 230/1, Advant Station 500 Series Operator Station, and MasterView 800/1 stations.
- Function Chart Builder
  for application configuration of Advant Controller 400 Series and MasterPiece 200/1 stations in off-line mode. On-line and off-line handling of Advant Controller 100 Series are also supported.
- Bus Configuration Builder
  for configuration support of AdvaSoft for Windows and via Advant OPC Server for AF 100 also other Human Machine Interfaces.

For detailed information about the products see Section 1.8, Product Overview.

This user's guide is the primary documentation for AMPL Control Configuration 1.7.
It is valid for:

- Application Builder version 2.7
- Function Chart Builder version 4.7
- On-line Builder version 2.7
- Bus Configuration Builder version 2.7.

On-line Builder commands and Function Chart Builder functions are described in separate manuals (see Section 1.5, Related Documentation).

Hardware

Advant Station 100 Series Engineering Stations are available for Windows NT:

- Advant Station 120 Engineering Station (PCI)
- Advant Station 130 Engineering Station (ISA).

They include all necessary software (AMPL Control Configuration) and hardware (host personal computer, Advant Station 100 Series Engineering Board).

Advant Station 100 Series Engineering Board is needed for command execution when you work with target system types other than Advant Controller 100 Series.

Advant Station 120 Engineering Station (PCI) includes the Advant Station 100 Series Engineering Board – PCI (PU516). Advant Station 130 Engineering Station (ISA) includes the Advant Station 100 Series Engineering Board – ISA (DSPU131).

Target Systems

This software and hardware serve for configuration, application building, fault tracing, documentation, testing and commissioning of the following target systems:

- Advant Controller 100 Series
- Advant Controller 400 Series
- Advant Station 500 Series Operator Stations
- MasterPiece 51
- MasterPiece 200/1
- MasterView 800/1
- MasterGate 230/1
- AdvaSoft.

1.2 Equipment Requirements

CAUTION

If an own suitable personal computer is intended to be connected on-line to a target system or an industrial process, it has to fulfill, together with the built-in Advant Station 100 Series Engineering Board and its peripherals, all requirements listed below under "Alternative 1".

Depending on the environment in which it shall be used, an own suitable personal computer has to fulfill the following requirements:

Alternative 1: On- and off-line use in industrial environment

The personal computer has to fulfill the requirements stated in the section "Environmental Immunity" of the *Advant OCS with Master Software Overview Product Guide* and the following standards:

- EN 50081-1EMC, Emission
- EN 50082-2EMC, Immunity
- EN 60950Electrical safety.

Alternative 2: Only off-line use in residential, commercial and light industrial environment; on-line use is not permitted

The personal computer has to fulfill the following standards:

- EN 50081-1 EMC, Emission
- EN 50082-1 EMC. Immunity
- EN 60950 Electrical safety.

Further requirements concerning personal computers that carry an Advant Station 100 Series Engineering Board are the following:

- IBM PC compatible, with at least 90 MHz Pentium CPU
- At least 32 MByte RAM, 64 MByte RAM recommended
- CD-ROM drive for installation of software
- At least 2 GByte hard disk
- At least a VGA graphics adapter; 1024 x 768 resolution recommended
- One port for mouse or trackball connection
- One serial communication port for Advant Controller 100 Series connection
- One parallel or serial port for the printer, unless printing via network
- Operating system Windows NT 4.0.
  For requirements concerning Windows NT and its Service Packs,
  see *On-line Builder Release Notes*.

Further requirements in case of engineering board PU516 (PCI):

- One free PCI expansion slot, full length
- Power requirements for the engineering board PU516:
  - +5V 13W, +12V 1.5W without connection to MB300 transceiver
  - +5V 13W, +12V 7.5W when connected to MB300 transceiver.

Further requirements in case of engineering board DSPU131 (ISA):

- One free ISA expansion slot, AT size long and XT high
- Power requirements for the engineering board DSPU131:

  +5 V 1.6 A, +12 V 25 mA, -12 V 25 mA.
- Free ISA memory from C800H:0H to CBFFH:FH for the engineering board DSPU131:
  - Make sure that the BIOS of this personal computer allows ISA boards to use the memory area C8000-CBFFF.
  - The memory area at C8000-CBFFF must not be occupied by any other hardware.
  - The memory area at C8000-CBFFF must not be cashed, shadowed, swapped, or moved by the BIOS.
- 4 bytes free I/O space at address 320H for the engineering board DSPU131.

Remark: Engineering board DSPU130 (the predecessor of DSPU131) required one free AT size long and AT high ISA expansion slot.

NOTE

While all reasonable efforts have been made to make certain that the engineering board works on all computers meeting these specifications, responsibility for compatibility in each individual case cannot be assumed. The only way to make sure that the engineering board is running in your personal computer, is to test the personal computer together with the board.

1.3 How to Use This Book

This book is valid for Application Builder running under Windows NT.

Introduction

General information about AMPL Control Configuration and a product overview is included in Chapter 1, Introduction.

Installation

All details concerning setup procedures you will find in Chapter 2, Installation.

Configuration and Application Building

In Chapter 3, Configuration and Application Building, the functions of Application Builder are presented. Beside the detailed description of all menus and dialogs you find also important operating instructions.

Runtime Operation

Chapter 4, Runtime Operation: not applicable here.

Maintenance

In Chapter 5, Maintenance you find some information on diskette handling.

Appendix A

In Appendix A, National Characters language specific differences are described.

Appendix C

Appendix B, Glossary supports you with definitions on terms used in this documentation.

1.4 Conventions

The names of referenced manuals are in italics.

Keyboard Interaction

When you read	You shall
• **File | Copy**	Open the **File** menu and choose the item **Copy**.
• CTRL+M	Press the CTRL key and the key labeled M simultaneously.

Syntax

To start a program or a command, enter the command syntax and press the ENTER key. Specify the directory if needed.

- Bold strings are the command names and directories; they must be typed as they appear.
- Italic strings represent substitutable arguments and directories.

1.5 Related Documentation

Table 1-1. Related Documentation

Category	Title	Description
Station	Advant Station 100 Series Engineering Station User's Guide	Describes the Advant Station 100 Series Engineering Stations' hardware.
Software	Function Chart Builder User's Guide	This guide describes how Function Chart Builder can be used to configure different target systems.
	Bus Configuration Builder User's Guide	This guide describes the Bus Configuration Builder
	On-line Builder User's Guide	This Guide describes the Windows functions of On-line Builder. Beside the detailed description of all runtime operation menus and dialogs you find also important information about special print functions, start-up procedures and command line editing functions.
	On-line Builder Reference Manual	Describes all commands. Command sets and working methods are described as well as command file handling aspects.
	AMPL Control Configuration Commands for Structure Builder User's Guide	This guide describes the Control Configuration commands when Structure Builder is used as navigation tool (cooperating mode)
Other	AMPL Configuration Advant Controller 400 Series Reference Manual	Contains instructions for configuration and application programming of AC 410/450 controllers including command descriptions. The topics are: AMPL configuration principles, application programming, commissioning and testing, on-line editing, documentation, backup and transfer of application data.
	AMPL Configuration Advant Controller 100 Series Reference Manual	Contains instructions for configuration, application programming, fault tracing, and maintenance of AC 100 Series controllers.

1.6 Release History

Version 3BSE 007 031R0001
describes AdvaBuild for Windows 1.0/0 (Application Builder version 2.0, Function Chart Builder version 4.0, On-line Builder version 2.0, Bus Configuration Builder version 2.0) and is the initial history version.

Version 3BSE 007 031R0101
describes AdvaBuild for Windows 1.1/0 (Application Builder version 2.1, Function Chart Builder version 4.1, On-line Builder version 2.1, Bus Configuration Builder version 2.1).

Version 3BSE 007 031R0201
describes AdvaBuild for Windows 1.2/0 (Application Builder version 2.2, Function Chart Builder version 4.2, On-line Builder version 2.2, Bus Configuration Builder version 2.2), and On-line Manuals version 1.0/0.

Version 3BSE 007 031R0301
describes AdvaBuild for Windows 1.3/0 (Application Builder version 2.3, Function Chart Builder version 4.3, On-line Builder version 2.3, Bus Configuration Builder version 2.3), and On-line Manuals version 1.1/0.

Version 3BSE 007 031R0401
describes Application Builder version 2.4 under Windows 3.11 and Windows NT 4.0

Version 3BSE 007 031R0501
describes Application Builder version 2.5 based on Windows 3.11 and Windows NT 4.0

Version 3BSE 007 031R601
describes Application Builder version 2.6 based on Windows NT 4.0

Version 3BSE 007 031R701
describes Application Builder version 2.7 based on Windows NT 4.0, update FCB data functions added.

1.7 Terminology

Advant OCS

The term "Advant OCS" is used for Advant Open Control Systems with Master software. Open Control Systems (OCS) is used to describe the new generation of automation systems.

Advant Station 100 Series Engineering Stations

The term "Advant Station 100 Series Engineering Stations" is used for Advant Station 120 Engineering Station (AS 120ES) and Advant Station 130 Engineering Station (AS 130ES).

Engineering Station

The term "engineering station" is used for Advant Station 100 Series Engineering Station.

Engineering Board

The term "engineering board" is used for Advant Station 100 Series Engineering Board.

Advant Controller 400 Series

The term "Advant Controller 400 Series" is used for Advant Controller 410 and Advant Controller 450.

Advant Controller 100 Series

The term "Advant Controller 100 Series" is used for Advant Controller *X* where *X* may have a value from 1 to 199.

Advant Station 500 Series Operator Stations

The term “Advant Station 500 Series Operator Stations” is used for Advant Station 510 Operator Station, Advant Station 515 Operator Station and Advant Station 520 Operator Station.

Host Personal Computer

The term “host personal computer” is used for all Advant Station 100 Series Engineering Stations’ hardware, which is a portable, robust and hardened industrial personal computer, fulfilling all relevant Advant OCS environmental immunity specifications and safety standards.

1.8 Product Overview

1.8.1 AMPL Control Configuration

AMPL Control Configuration is based on Windows NT 4.0 and consists of the following components:

- Application Builder
- Function Chart Builder
- Bus Configuration Builder.

The following options to AMPL Control Configuration are available:

- On-line Builder
- PC and DB Element Libraries.

PC and DB Element Libraries contain DB and PC element libraries for

- Advant Controller 100 Series
- Advant Controller 400 Series and
- MasterPiece 200/1
- AdvaSoft
- PC and DB element reference manuals in PDF format.

To work with Function Chart Builder at least one AMPL PC or DB Element Library must be installed. Further AMPL PC and DB Element Libraries are available from various Business Units and other ABB companies for application specific extensions of controllers.

1.8.2 Function Overview

1.8.2.1 Application Builder

Application Builder is the outer shell for the other tools included in AMPL Control Configuration. If you work under Windows NT with AdvaBuild Engineering Software, two alternative modes of working are available:

- Cooperating mode
- Independent mode.

In cooperating mode all engineering data are kept together by Advant objects. Each Advant object contains several aspects. The aspects are the entities the different Builders are working on. In this mode, the Structure Builder is the tool for navigating through the whole project. Application Builder is not used for navigation. For more information about the functions available in cooperating mode see the *AMPL Control Configuration Commands for Structure Builder User's Guide*.

In independent mode, the Application Builder is the navigation tool. No Advant objects are supported. In independent mode, Application Builder can work together with the following Builders:

- Function Chart Builder (see Section 1.8.2.2, Function Chart Builder)
- Bus Configuration Builder (see Section 1.8.2.3, Bus Configuration Builder)
- On-line Builder (see Section 1.8.2.4, On-line Builder).

The relation between the tools is as follows:

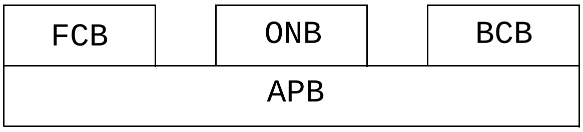


Figure 1-1. Relationship Between the Different Tools

Further on, an appropriate text editor—AS100-EDIT—is available (see Section 1.8.2.5, AS100-EDIT).

Project and Data Administration

Application Builder keeps the engineering data for several projects, each consisting of several nodes and/or circuits and type circuits. The projects can be stored below different project roots, which may reside on the local hard disk or on a central server. This takes into account the demands of service engineers as well as project engineers working as a team together on the same project.

Application Builder can store default values to be used throughout a project and supports exchange of configuration data between different nodes and different projects. Application Builder administrates also the application data within AMPL Control Configuration.

Following functions are available:

- Administration of projects, nodes, circuits, and type circuits
- On-line help
- Project defaults to be used as standard setting within a project team
- Exchange of application data
- Administration of different product versions
- Support of network Advant Station 100 Series Engineering Stations

- Setup for local and network installation
- Extended copy functions to maintain project data
- Functions to update FCB data of projects, nodes, circuits, and type circuits.

1.8.2.2 Function Chart Builder

Function Chart Builder provides a Windows based, easy-to-use environment for application programming of Advant Controller 400 Series, MasterPiece 200/1, and Advant Controller 100 Series. It offers an efficient method of function oriented project engineering by supporting type circuit, circuit and node structure. This ensures a high software quality and low maintenance efforts.

Functions of Function Chart Builder

- Graphic Windows based user interface including
  - Different windows containing application program, database, symbol, and terminal sections (also several of one type) with the possibility of comfortable interconnections and storage of window configurations
  - On-line help
  - Accelerator keys for keyboard operation
  - Toolbar buttons and context menus for fast mouse operation
  - Zoom function and context menu in function chart.
- Comfortable cut, copy and paste function. Cut, copy and paste is possible when editing the PC section off-line.
- Multilevel “Undo” and “Redo” for all editing functions
- Off-line editing (that is, without the need of being connected to a controller) for:
  - Application programs in the graphical function chart representation
  - Application programs in a tree representation for an overview of the application program structure
  - Data base elements including comfortable filter possibilities
  - Symbols and terminals to define formal parameters of type circuits and circuits.
- Import and export of source code for:
  - Application programs
  - Data base elements
  - Type circuits
  - Circuits
  - Node structures.
- Check of PC source code with and without DB element connections

- Documentation
  - Graphic documentation of application programs in function chart representation
  - Overview documentation of application programs in tree representation
  - Data base documentation in condensed list form
  - Documentation of the symbol values for instantiated type circuits and circuits
  - PC and DB element cross reference lists
  - Documentation of the software options used
  - Documentation layouts according to international standards (IEC 1082 and DIN 6771).
- Support of function oriented project engineering including:
  - User-defined standard solutions (type circuits)
  - Function oriented, controller environment independent and parallel configuration (circuits).
- Support of other ABB application specific controller options.
- Calculations of computing times and memory consumption for all Advant Controllers.

Additional Functions for Advant Controller 100 Series

- Generation of target code including bus configuration data
- Direct access to Advant Controller 100 Series via serial line
- Direct access to Advant Controller 100 Series (except Advant Controller 55) via Advant Fieldbus 100 from AdvaSoft for Windows
- Remote access to Advant Controller 100 Series (except Advant Controller 55) via:
  - Another directly connected Advant Controller 100 Series (except Advant Controller 55) on the same Advant Fieldbus 100
  - Advant Controller 400 series and Advant Fieldbus 100.
- Target system control including:
  - Download of application program
  - Save and clear application in PROM (flash-type)
  - Start and stop application program
  - Report status, report options available on the controller
  - Read/set date and time
  - Restart controller.
- On-line editing (that is, while connected to a controller) for:
  - Application program in function chart representation
  - Data base elements.

- Testing and fault tracing
  - Dynamic display of variables and signals in function chart, table, and trend line form
  - Forcing of variables and signals in function chart and in table form.
- Diagnostic functions
- Single point engineering including automatic export and import to/from AdvaSoft for Windows, Advant OPC Server for AF 100, or other controllers by means of extended DB elements for:
  - Advant Controller configuration
  - AdvaSoft for Windows configuration
  - Advant OPC Server for AF 100.

See *Function Chart Builder User's Guide* for more information.

1.8.2.3 Bus Configuration Builder

Bus Configuration Builder supports generation of configuration data for AdvaSoft for Windows and via Advant OPC Server for AF 100 for other Human-Machine Interface systems. It collects data generated by Function Chart Builder for Advant Controller 160, Advant Controller 110, Advant Controller 70, and Advant Controller 400 Series controllers connected to Advant Fieldbus 100. The collected data are checked for consistency of addresses, then they are made available in a form depending on further use.

For more information see the *Bus Configuration Builder User's Guide*.

The following additional functions are available:

- Generation of reports with check results
- Generation of reports with cross references of sending and receiving Data Sets and extended DB elements
- Calculation of bus load.

1.8.2.4 On-line Builder

With On-line Builder you design and test application programs by entering commands on the keyboard or by using command files.

NOTE

On-line Builder requires Advant Station 100 Series Engineering Board or the Real Time Accelerator Board.

Function Overview

On-line Builder provides all needed functions when working with target systems such as Advant Controller 400 Series, Advant Station 500 Series Operator Stations, MasterView 800, MasterPiece 200, MasterGate 230/1 and MasterPiece 51. Advant Controller 100 Series target systems are not supported by On-line Builder.

You can create your own powerful command procedures to meet your specific needs.
On-line changes of Advant Controller 400 Series and MasterPiece 200 target systems while the process is running are also supported.

Basic Functions

- File handling
- Kermit file transfer
- Selection of target system
- Command file handling
- Symbol handling
- Performance analysis
- Backup and restore of application data
- Hard copy
- Help function.

Functions for Advant Controller 400 Series and MasterPiece 200 Configuration

- Dimensioning of data base and application program areas
- Data base configuration
- Application program entry, editing and on-line modification of PC programs during program execution
- Application program documentation, in graphic or list form
- Source code loading and dumping of application programs and data base contents
- Testing and fault tracing
- Dynamic display of variables, display and modification of parameters
- Forcing of inputs and outputs
- Reading/setting of date and time.

Functions for MasterPiece 51 Configuration

- Source code program entry and editing, including comments
- Loading and dumping of programs to/from MasterPiece 51 through MasterFieldbus and Advant Controller 400 Series and MasterPiece 200/1 (and MasterNet).

Function for MasterGate230/1 Configuration

Data base handling.

Functions for Advant Station 500 Series Operator Station and MasterView 800/1 Configuration

- Data base handling
- Configuration
- Fault tracing.

Function for Network Management Service

Testing, maintenance and fault tracing in ABB MasterNet networks.

Fieldbus Functions

- Support for LON fieldbus and LON PC and DB elements
- Support for PROFIBUS-DP and PROFIBUS PC and DB elements.

For information about the (Windows) user interface, see the *On-line Builder User's Guide*. For information about the On-line Builder commands (earlier: command oriented functions), see the *On-line Builder Reference Manual*. For information on working with On-line Builder and for controller related information, see *AMPL Configuration Advant Controller 400 Series Reference Manual*.

1.8.2.5 AS100-EDIT

AMPL Control Configuration contains the text editor AS100-EDIT in order to create project documentation and to view and edit source code. AS100-EDIT is a text editor without any file size limitation, you can use the standard document texts (or others) for the documents. In addition AS100-EDIT allows to have multiple documents open.

The files can be in general representation (8-bit ANSI) or on files in ABB Master representation (7-bit ASCII). All necessary conversions will be done internally. See Section 3.6.3.26, File | Convert for more information about file conversions and formats.

1.8.2.6 AMPL PC and DB Element Libraries

Together with the AMPL PC and DB Element Libraries for Function Chart Builder, also the appropriate DB and PC Element Reference manuals, may be installed. If you install the manuals, you have access via the Help menu in Function Chart Builder and On-line Builder to DB and PC reference manuals for the following target systems, depending on the selection you made during installation:

- Advant Controller 400 Series
- Advant Controller 100 Series.

The manuals can be read with Adobe™ Acrobat™ Reader, which is delivered together with AMPL Control Configuration. Instead of Acrobat Reader you can also use Acrobat Exchange to read the manuals.

1.8.3 Target System Configuration

The following table lists the target systems supported by AMPL Control Configuration:

Table 1-2. Supported Target Versions

Target Versions	**Function Chart Builder 4.7**		**On-line Builder 2.7**	**Bus Configuration Builder 2.7**
	off-line	**on-line**		
AC 450 with SW QC07-BAS41*4.0	yes		yes	yes
AC 450 with SW QC07-BAS41*3.0	yes		yes	yes
AC 450 with SW QC07-BAS41*2.0	yes		yes	yes
AC 450 with SW QC07-BAS41*1.0	yes		yes	yes
AC 450 with SW QC02-BAS21*9.0	yes		yes	yes
AC 450 with SW QC02-BAS21*8.0	yes		yes	yes
AC 450 with SW QC02-BAS21*7.0	yes		yes	yes
AC 410 with SW QC01-BAS11*11.0	yes		yes	yes
AC 410 with SW QC01-BAS11*10.0	yes		yes	yes
AC 410 with SW QC01-BAS11*9.0	yes		yes	yes
AC 410 with SW QC01-BAS11*8.0	yes		yes	yes
AC 410 with SW QC01-BAS11*7.0	yes		yes	yes
AC 160*2.0	yes	yes		yes
AC 160*1.2	yes	yes		yes
AC 160*1.1	yes	yes		yes
AC 160*1.0	yes	yes		yes
AC 110*2.3	yes	yes		yes
AC 110*2.2	yes	yes		yes
AC 110*2.1	yes	yes		yes
AC 110*2.0	yes	yes		yes
AC 70*1.2	yes	yes		yes
AC 70*1.1	yes	yes		yes
AC 70*1.0	yes	yes		yes
AC 55*1.1	yes	yes		yes
AC 55*1.0	yes	yes		yes

Table 1-2. Supported Target Versions

Target Versions	Function Chart Builder 4.7		On-line Builder 2.7	Bus Configuration Builder 2.7
	off-line	**on-line**		
AF100 OPC*1.0	yes			yes
AdvaSoft for Windows*1.3	yes			yes
AdvaSoft for Windows*1.2	yes			yes
AdvaSoft for Windows*1.1	yes			yes
MP 200/1*4.0	yes		yes	
MP 200/1*3.0	yes		yes	
MP 200/1*2.1	yes		yes	
MP 200/1*2.0	yes		yes	

The following tables give an overview about remote access to target systems for AMPL Control Configuration:

Table 1-3. Overview of Tool Access to Remote Advant Target Systems

	Remote Advant Target Systems			
Locally Connected Target System	**AC 400 Series**	**AC 110 or AC 160**	**AC 70**	**AC 55**
AC 400 Series	**AC 400** -> MB 300 -> **AC 400**	**AC 400** -> AF 100 -> **AC 110/AC 160** or **AC 400** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160** or **AC 400** -> MB 300 -> **AC 400** -> AF 100 -> **AC 110/AC 160** or **AC 400** -> MB 300 -> **AC 400** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160** or **AC 400** -> RCOM -> **AC 110/AC 160** or **AC 400** -> MB 300 -> **AC 400** -> RCOM -> **AC 110/AC 160**	**AC 400** -> AF 100 -> **AC 70** or **AC 400** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 70** or **AC 400** -> MB 300 -> **AC 400** -> AF 100 -> **AC 70** or **AC 400** -> MB 300 -> **AC 400** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 70**	**AC 400** -> RCOM -> **AC 55** or **AC 400** -> MB 300 -> **AC 400** -> RCOM -> **AC 55**
AC 110 or AC 160	-	**AC 110/AC 160** -> AF 100 -> **AC 110/AC 160** or **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160**	**AC 110/AC 160** -> AF 100 -> **AC 70** or **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 70**	-
AC 70	-	**AC 70** -> AF 100 -> **AC 110/AC 160** or **AC 70** -> AF 100 -> **AC 110/AC 160/AC 70** -> AF 100 -> **AC 110/AC 160**	**AC 70** -> AF 100 -> **AC 70** or **AC 70** -> AF 100 -> **AC 110/AC 160/AC 70** -> AF 100 -> **AC 70**	-
AC 55	-	-	-	-
AF 100 Interface Software	-	**AF100IF** -> AF 100 -> **AC 110/AC 160** or **AF100IF** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 110/AC 160**	**AF100IF** -> AF 100 -> **AC 70** or **AF100IF** -> AF 100 -> **AC 110/AC 160** -> AF 100 -> **AC 70**	-

Table 1-4. Overview of Tool Access to Remote Master Target Systems

	Remote Master Target Systems				
Locally Connected Target System	**MP 200/1**	**AC 400**	**MV 800/1 Series**	**MG 230/1**	**MP 51**
MP 200/1	**MP 200/1** -> MB 300 -> **MP 200/1**	**MP 200/1** -> MB 300 -> **AC 400** or **MP 200/1** -> MB 300 -> **AC 400** or **MP 200/1** -> MB 300 -> **AC 400** -> see Table 1-3	**MP 200/1** -> MB 300 -> **MV 800/1**	**MP 200/1** -> MB 300 -> **MG 230/1**	**MP 200/1** -> MasterFieldbus -> **MP 51** or **MP 200/1** -> MB 300 -> **MP 200/1** -> MasterFieldbus -> **MP 51**
MV 800/1 Series	**MV 800/1** -> MB 300 -> **MP 200/1**		**MV 800/1** -> MB 300 -> **MV 800/1**	**MV 800/1** -> MB 300 -> **MG 230/1**	**MV 800/1** -> MB 300 -> **MP 200/1** -> MasterFieldbus -> **MP 51**
MG 230/1	**MG 230/1** -> MB 300 -> **MP 200/1**		**MG 230/1** -> MB 300 -> **MV 800/1**	**MG 230/1** -> MB 300 -> **MG 230/1**	**MG 230/1** -> MB 300 -> **MP 200/1** -> MasterFieldbus -> **MP 51**
MP 51	-		-	-	-

1.9 User Interface

Application Builder is a Windows NT application program with typical graphic user interface and look-and-feel of Windows NT programs. It presents the different objects in windows, offers menus and dialog boxes. You choose the commands by accelerator keys and shortcuts on the keyboard or by mouse actions. In some windows, also the right mouse button is supported. Then you have access to the most important menu commands.

See the Windows documentation for information about the user interface.

Chapter 2 Installation

See *Application Builder Release Notes*.

Chapter 3 Configuration and Application Building

3.1 Considerations

Application Builder (APB) is the basic tool for Function Chart Builder (FCB), On-line Builder (ONB), and Bus Configuration Builder (BCB).

Application Builder is able to hold multiple document windows at the same time. Nodes, type circuits, and circuits are displayed in such document windows (**Node List**, **Circuit List**, **Type Circuit List**), from where you can select them. Document windows remain open during the working session, so you can switch very fast between different objects (for example, a circuit and a node) in the different document windows and run tools on them.
To get help on the document windows simply press the F1 key.

Choose commands in menus of the **Menu Bar** or—after clicking with the right mouse button—in the context menus. Temporarily disabled menu items are dimmed or grayed, dependent on the program context.

Command shortcuts are available also in the **Toolbar**.

Normally you start the Application Builder first, and from there you can start the other tools. Nevertheless you can start a tool via its shortcut directly to have faster access. When you have already worked before with that tool, then the same node, type circuit, or circuit as before will be the object. Otherwise you get a message that you shall use the Application Builder in order to assign an appropriate object for that tool.

NOTE

Application Builder, On-line Builder, and Bus Configuration Builder can run once only, Function Chart Builder may be open several times.

To get information on navigation in Application Builder, see Section 3.5.1, Navigation.

3.2 Capacity and Performance

Not applicable here.

3.3 Application Start-up

You can start Application Builder as follows:

Start | Advant | Engineering | Application Builder 2.7-0.

AS100-EDIT is started as follows:

Start | Advant | Engineering | Utilities | AS100-EDIT 2.7-0.

3.4 Tutorial

Not applicable.

3.5 Application Procedures

3.5.1 Navigation

Application Builder is a tool to build an environment which is needed to work with the other tools like Function Chart Builder. The environment has a hierarchical structure. The top level object for Application Builder is a project. The project contains global data like the selected national characters, document texts or page setup which are common for the objects (node, circuit, or type circuit) belonging to the project. Application Builder administrates these objects whereas the tools like Function Chart Builder work on these objects.

See examples:
Section 3.5.3, Create an Object for Working with a Tool on It,
Section 3.5.4, Open an Existing Object for Working with a Tool on It.

3.5.2 Usage of Page Layout Templates

General

Four different kinds of page layout templates exist:

- Standard Master
- IEC 1082
- DIN 6671
- Plain.

Each of the page layout templates are available in different formats and orientations:

- Portrait
- Landscape
- A3
- A4
- Letter
- Legal.

NOTE

> Not all formats and orientations are available for each page layout template. All page layouts are available in English only.

Selecting Page Layout Template

1. Choose the **File | Page Setup** command.
2. Change the document type to that type you want to use (choose the correct format and orientation) in the **Page Setup** dialog.

3. Click on the **Use Default**s button in order to change the **Rows** and **Columns** values, which fit to the document type chosen.

NOTE

If you change only a format or orientation of a page layout template, then the already introduced document texts (Edit Document Texts dialog) will be copied and remain the same. If you change between the four different kinds of page layout templates, then the document texts must be introduced another time (even if they were existent before).

Alternatively you can change an existing document type by clicking the **Project Defaults** button. You use then the predefined page layout template, rows and columns values and document texts.

Example

Suppose you have three page layout template sets available. Set A is the standard template set delivered with AMPL Control Configuration. Set B is a special template set that you created for your customer B, set C is used for customer C. Now you create three projects, Project 1 with set A, project 2 with set B, and project 3 with set C. When defining a page layout for a document in project 1 using the **File | Page Setup** command, you will be able to select one of the page layouts in set A, for project 2 only the page layouts of set B are available, project 3 offers the page layouts of set C.

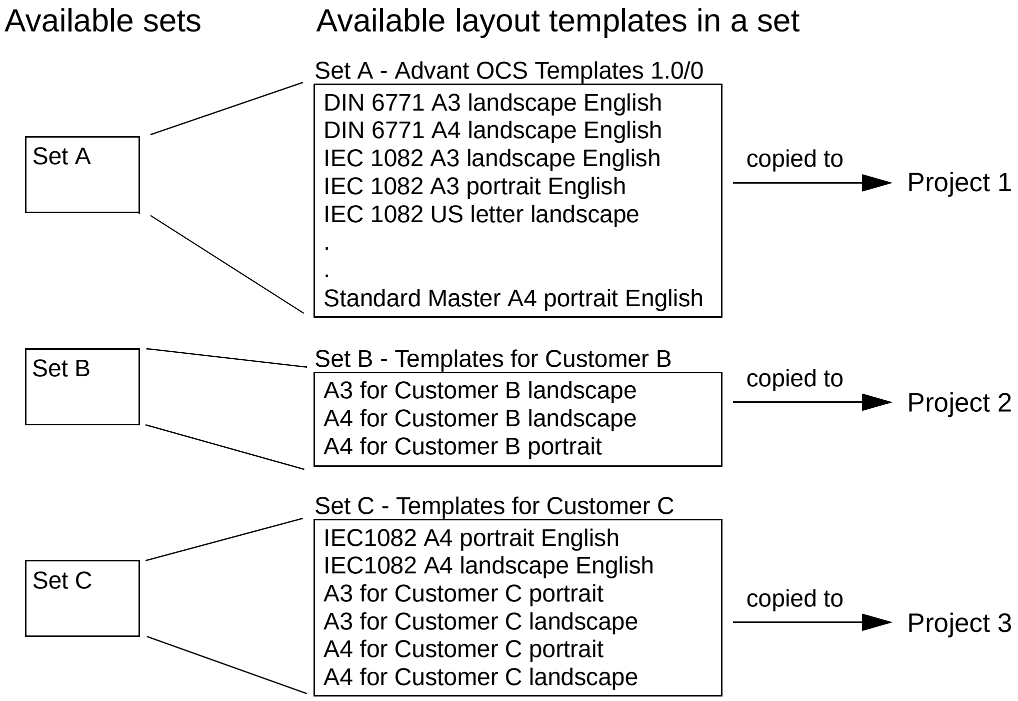

Available sets
Available layout templates in a set
Set A - Advant OCS Templates 1.0/0
DIN 6771 A3 landscape English
DIN 6771 A4 landscape English
IEC 1082 A3 landscape English
IEC 1082 A3 portrait English
IEC 1082 US letter landscape
.
.
Standard Master A4 portrait English
Set A
copied to
Project 1
Set B
Set B - Templates for Customer B
A3 for Customer B landscape
A4 for Customer B landscape
A4 for Customer B portrait
copied to
Project 2
Set C - Templates for Customer C
IEC1082 A4 portrait English
IEC1082 A4 landscape English
A3 for Customer C portrait
A3 for Customer C landscape
A4 for Customer C portrait
A4 for Customer C landscape
Set C
copied to
Project 3

Figure 3-1. Handling of Page Layout Template Sets

3.5.3 Create an Object for Working with a Tool on It

Example: You want to create a circuit with Function Chart Builder

1. Create a project in Application Builder, if it does not yet exist, via the menu item **File | New | Project**. If the projects exists, open the project using the menu item **File | Open | Project**.
2. Create a new circuit in Application Builder via the **File | New | Circuit** command.
3. Select the circuit in the **Circuit List**.
4. Start Function Chart Builder via the **Tools | Function Chart Builder** command.

3.5.4 Open an Existing Object for Working with a Tool on It

Example: You want to work on an existing node with On-line Builder:

1. Open the project the node belongs to using the menu item **File | Open | Project**.
2. Open the **Node List** using the **File | Open | Node List** command.
3. Select the node in the **Node List**.
4. Start On-line Builder via the **Tools | On-line Builder** command.

3.5.5 Working with Different Versions of Tools

Different versions of AMPL Control Configuration can be installed on the same engineering station. This feature ensures a maximum of flexibility for your work. Three cases may occur:

Case 1:

You want to create nodes, circuits, or type circuits using the newest versions.

Solution:

When creating nodes, circuits, or type circuits, the new tool versions are used automatically when starting a tool. Nevertheless, you can select another version manually.

Case 2:

You want to work on already existing nodes, circuits, and type circuits with the old versions the objects were created with.

Solution:

You can simply continue working with that object. The tool version remains unchanged until you change it (see case 3).

An exception is the On-line Builder version:

You will always work with the newest On-line Builder version of your engineering station, except when you start an older On-line Builder version directly by using its group icon or via an older Application Builder version.

Case 3:

You want to work on already existing nodes, circuits, and type circuits and want to switch to the new version.

Solution:

You select the objects, you want to switch to a newer tool version. For this perform the following steps:

1. Click with the right mouse button and select the **Modify Tool Versions** command in the context menu.
2. In the **Select Tool Versions** dialog select the newer Function Chart Builder version.
   All tool versions, which fit to this target system, are selectable.

Alternatively you may

1. Start up the **File | Modify** .
2. Click the **More** button, then the **More Settings** dialog pops up.
3. Choose **Tool Versions** to start up the **Select Tool Versions** dialog.
4. Select the newer Function Chart Builder version. All tool versions, which fit to this target system, are selectable.

3.5.6 Upgrading/Changing Function Chart Builder Version

Introduction

The objects are processed by Function Chart Builder in internal data representation, in form of *.ODB files. The internal data representation is FCB version specific.

The exchange format is the source code, which is stable over a large range of FCB versions.

If you upgrade the Function Chart Builder to a new version and you want to continue working on "old" objects, it is mandatory to update their internal data representation

Manual Method for Updating

1. Start Function Chart Builder of the current (older) version.
2. Generate source code to convert the data of the current object from the internal data representation into the exchange format.
3. Exit the (old) Function Chart Builder.
4. Select the corresponding object in the **Node**, **Circuit**, or **Type Circuit List**.
   Modify the tool version for it by one of the following commands:
   - Click the right mouse button and choose the **Modify Tool Versions** command in the context menu.
   - Choose the **File | Modify** command, activate the **More…** button, and use the **Tool Versions** dialog to modify the tool version.

5. Select the (new) Function Chart Builder version you want to work with.
6. Start Function Chart Builder (the version selected in step 5 is started).
7. Initialize the node/circuit/type circuit and backtranslate the source code generated in step 2.

Automatic Method for Updating

Choose the **File | Update FCB Data | Project** command to update the internal data representation of all objects of a project.

Or select the one or more objects of a kind of a project and choose the **File | Update FCB Data | Selected** command

Also these commands execute the steps suggested for the manual method.

3.5.7 Usage of AMPL PC and DB Element Libraries

Introduction

When you create a node, you have to specify a node type and version. This node type is defined through the AMPL PC and DB Element Libraries. When you create a node the libraries of the Function Chart Builder are used. You may change the usage of libraries using the Function Chart Builder Libraries dialog with one of the functions of the **Function Chart Builder Libraries** dialog after creation of a node:

Import

This function copies the libraries from Function Chart Builder to the node. Using the libraries on node level may be useful if you want to modify the libraries. The library is not deleted from Function Chart Builder.

Export

The export function copies the node libraries, that were imported before, to Function Chart Builder. You may want other users use the modified and well tested library.

Delete

The delete function deletes the library from the node. The library of Function Chart Builder will be used after the library is deleted.

The **Modify Node** dialog shows the current level of library usage and the currently used Function Chart Builder version.

3.5.8 Locking

General

The lock mechanism of Application Builder has two different levels of locking:

- You can lock an object explicitly to prevent it from access by other users. Use the **Node List**, **Circuit List** or **Type Circuit List** document windows to lock an object. The locked objects are marked with "L" in the first column of the corresponding document window. Each locked object must be unlocked manually. Use the explicit locking mechanism to prevent access also for those times, when no tool is running on that object.
- While you work on a node, circuit, or type circuit, the object is locked for you and all other users as in case of explicit locking. An object is unlocked automatically when you stop working with it.

NOTE

If you have access to a node, you can run Function Chart Builder and On-line Builder on the same node in parallel.

Indication of Locking

The first column on the left hand side of the **Node List**, **Circuit List**, and **Type Circuit List** shows an:

- "L" if the node is locked by this Application Builder.
- "l" if the node is locked by another Application Builder in a network configuration.

WARNING

You can unlock a locked node, circuit, or type circuit manually (intentionally) using the **Lock/Unlock** button. Doing so may lead to multiple access of data and can therefore lead to loss of data (a warning message will be displayed).

3.5.9 Restrictions on Parallel Execution

You can start the following Builders only once:

- Application Builder
- On-line Builder
- Bus Configuration Builder.

Function Chart Builder may be started more than one time on different objects.

If Function Chart Builder detects that the internal data representation (*.ODB file) of the given object is already open, for example, located on a network drive and accessed by another user, Function Chart Builder prompts to open a read-only copy of the *.ODB file instead. In that case you can view and print function chart, and so on, but cannot modify the object.

3.5.10 Converting Source Files

Introduction

The tools of AMPL Control Configuration use two different file representations for source code files. Files generated by Function Chart Builder are in general representation. On-line Builder files are stored in ABB Master representation.

Therefore it is necessary to convert the source code from one representation to the other and vice versa, in order to transfer source code files between the tools. The convert function is necessary in addition to transfer source code between the tools on different hardware platforms (see figure below).

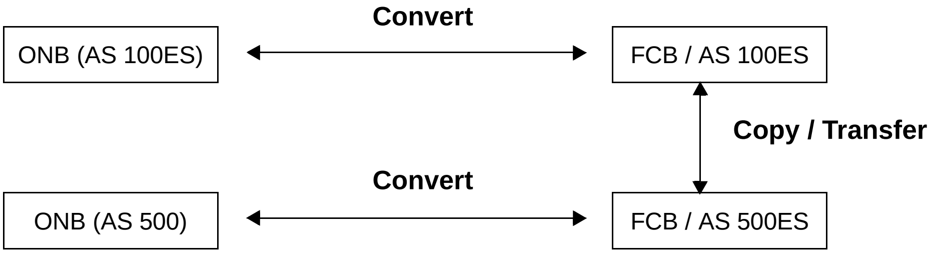


Figure 3-2. Source Code Transfer Between Tools and Different Platforms

Converting for On-line Builder

To convert PC source code and DB source code files (generated by Function Chart Builder or command files in general representation) into ABB Master representation (7-bit source code) for the On-line Builder, proceed as follows:

1. Choose the **File | Convert** command.
2. In the **Convert Source Code Files** dialog box, select the file type you want to convert.
3. Select one or more files in the **Files** list box on the left hand side of the **Convert** dialog. The conversion direction is automatically defined with the selection.
4. Click the **right arrow** button, or the **Apply** button, or the **OK** button to perform the conversion.
    a. When you click the **OK** button the files that are selected will be converted, the dialog box is closed.
    b. When you click the corresponding **arrow** button or the **Apply** button, the files that are selected will be converted, but the dialog remains open. After the conversion the list box will be updated with the new date and time of the files.

The source code is transferred
from \PCDATA (*.AAX, *.TIX), \DBDATA (*.BAX, *.TBX), \TCDATA (*.TCS), and \LIST (*.CFX)
to the SRCE and USER directory of the same node.

The program changes the file extension to *.AA, *.TI, *.BA, *.TB, *.TC, *.CF.

Converting for Function Chart Builder

To convert PC source code and DB source code files (generated by On-line Builder or command files ABB Master representation) into general representation (8-bit source code) for the Function Chart Builder, proceed similarly but in step 3 select files in the **Files** list box on the right hand side and in step 4 click the **left arrow** button. Then the files will be converted into the general representation (left hand side)

The files are converted
from \SRCE (*.AA, *.BA, *.CF) and \USER (*.TI, *.TB, *.TC)
to the PCDATA and DBDATA directory of the same node, to the TCDATA for the *.TC files, and to the LIST directory for the command files.

The program changes the file extension to *.AAX, *.BAX, *.TIX, *.TBX, *.TCS, and *.CFX.

If a PC or DB source code file consists of multiple files, so-called continuation files, they are automatically concatenated to one resulting file which can be used by Function Chart Builder.

3.5.11 Extracting PC Source Files

Extracting (and Converting)

To extract PC source code files and to convert them into ABB Master representation (7-bit source code), proceed as follows:

1. Choose the **File | Extract** command.
2. In the **Extract and Convert PC Source Code** dialog box, select the file you want to extract in the **File** list box on the left hand side.
3. Define a name for the output file (must not be identical with the input file name), or use the default name.
4. Specify a start and stop PC item designation to define, which part of the PC program you want to extract. The stop item designation may contain an asterisk (*) as wild card. An asterisk is allowed only once in the item designation and only after the period (.) character. No other character must follow. The wild card is useful if you do not exactly know the number of PC elements below a PC element.
5. Click the **arrow** button, or the **Apply** button, or the **OK** button to perform the extraction.
   a. When you click the **OK** button, the file will be converted, the dialog box is closed.
   b. When you click the **arrow** button or the **Apply** button, the file will be extracted, but the dialog remains open.

The source code is transferred from "\PCDATA (*.AAX)" to the SRCE directory of the same node and changes the file extension to "*.AA" of the given output file name.

Example 1

The following table shows some examples of start and stop item designations and the corresponding extractions.

Table 3-1. Extract, Example 1

Start	Stop	Part That Is Extracted
PC1	PC1.3	PC1 to PC1.3 including PC1.3
PC1.1	PC1.*	PC1.1 to end of PC1
PC1.2	PC1.3.*	PC1.2 to the last element in PC1.3 (e.g. PC1.3.99)

Example 2

The start item designation shall be "PC1.2.1" and the stop item designation "PC1.3.*".

Table 3-2. Extract, Example 2

Source: EXAMPLE.AAX (general representation)	Function	Destination: Part1.AA (ABB Master representation)
BEGIN PC1 PC1 .. PC1.1 PC1.1.1 PC1.1.2 ... PC1.2 PC1.2.1 ... PC1.2.97 PC1.3 PC1.3.1 PC1.4 END PC1	Extraction and conversion -------------------->	BEGIN PC1.2 PC1.2.1 ... PC1.2.97 PC1.3 PC1.3.1 END PC1

3.5.12 Copying Application Data

Introduction

Use the **File | Copy** command to copy application data from a project, a node , a type circuit, or a circuit environment.

You can copy the following data:

- A whole project with nodes, type circuits and circuits (see Section 3.6.3.13, File | Copy - for Projects)
- One or more nodes (see Section 3.6.3.14, File | Copy - for Nodes)
- One or more circuits (see Section 3.6.3.16, File | Copy - for Circuits)
- One or more type circuits Section 3.6.3.17, File | Copy - for Type Circuits).

You can copy, for example, from the server to the engineering station and vice versa as well as on the engineering station locally, from one project to another project, or within one project. The **File | Copy** uses the selected node, circuit, or type circuit as default object to copy.

NOTE

If the destination node, type circuit, etc. does not exist, it will be created automatically and the source data will be copied to the destination.

Restrictions

No source data will be copied if:

- No project root exists as destination (it is not possible to select a destination in this case).
- Source and destination are identical.

In the following situations a warning message is displayed and data are only copied if you confirm it:

- The source is locked.
- The destination is locked.
- The node type of the destination differs from the node type of the source.
- Data exist on the destination node.

The above listed warnings are displayed hierarchically. For example, if data exist on the node and the nodes have different node types, then the warning regarding different node types is displayed first.

When selecting more than one object it is not possible to choose other names for the destination than the name of the source. When you have selected only one object you can specify a new name as destination.

Copy Application Data to a Central Network Server

When you are working in a network you may want to copy some application data from a server to your local hard disk on Advant Station 100 Series Engineering Station in order to take the engineering station with you on a plant. This means source and destination may be different devices.

When working with Advant Station 100 Series Engineering Station you can keep all your data locally on the engineering station. During installation it is also possible to enter network devices and directories for the application and system data environments for keeping the application and/or system data on a central network server.

NOTE

There will be no checks whether there is enough space on the destination before copying starts, because it is possible in a network configuration that at the time when space is checked there is enough space, but during copying another user writes on the server and then you do not have enough space left. If there is no space left at all you will get an error message that no data can be copied. The destination will be locked during the copy procedure so that it cannot be accessed by any other user.

3.5.13 Application Retrieval

NOTE

Application Retrieval is supported by Function Chart Builder 4.6 and higher.

The function is available only for node types explicitly supporting application retrieval, such as AC 80 2.0.

The application can only be retrieved if the Function Chart Builder with which the target code was generated is still installed.

Use the **File | Retrieve Application** to retrieve the application from the target. First, the **Connect Target** dialog of Function Chart Builder is displayed. Enter the relevant data to connect to the target. Then, Function Chart Builder tries to upload the node stored on the target. If uploading the node succeeded, the following dialog is displayed:

The **File | Retrieve Application** is available if the Node List is open.

The **File | Retrieve Application** fetches node information from the target by functions of Function Chart Builder. Using this function, the complete node on the target is restored in the project directory of your engineering station:

- The directory structure is created if necessary.
- Files uploaded from the target are copied to the appropriate directories, such as type circuits (*.TCS files) or DB and PC Element libraries.
- Target code is uploaded and backtranslated, you can start Function Chart Builder on this node to edit, analyze, or test the data.

For more details about this function, for example, about preparation of data and prerequisites, see the *Function Chart Builder User's Guide*.

3.5.14 Using the Text Editor

AMPL Control Configuration contains the text editor AS100-EDIT in order to create project documentation and to view and edit source code. A big advantage of AS100-EDIT is that you can use the standard document texts (or others) for the documents. In addition, AS100-EDIT allows to have multiple documents open.

Use the **Tools | Text Editor** command to start the editor. Alternatively you can start the editor from the **Extended View** dialogs when you have selected a corresponding file.
When you define the text editor with the **Options | Assign Double-click** command,
then the **File | Open** dialog box of the editor pops up if you select an object in a list.

You can specify another editor using the **Options | Preferences** command.

3.5.15 Configuration Files

At termination of a session, the Application Builder saves its current customization of the interface and its configuration, for example, the open project. All this information is used as default when starting a new session.

The configuration file contains the following information:

- Open project and related document windows
- Size and order of the open document windows
- Selected list entries in the document window in the foreground
- Project specific national characters
- Settings of the **Options | Preferences** command
- Whether the **Toolbar** and **Status Bar** are visible.
- Size of the application window
- What the mouse double-click in the document windows is assigned to.
- Last used printer, paper format, and orientation.

In addition, every project stores the following information:

- National characters for the source code
- Default settings.

3.6 Configuration/Application Building Menus

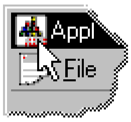
3.6.1 Controls and Indicators

3.6.1.1 Controls in Title Bar

The **Title Bar** is located along the top of a window. It contains the name of the application and document. To move the window, drag the **Title Bar**.

NOTE
You can also move dialog boxes by dragging their title bars.

The **Title Bar** may contain the following elements:

- Control menu button 

  Click on it to open the control menu with the commands
  - **Restore**
  - **Move**
  - **Size**
  - **Minimize**
  - **Maximize**
  - **Close**
  - **Next**
  - **Previous**.
- Name of the application or document
- **Maximize** button □
- **Minimize** button ▁ or **Restore** button 🗗
- **Close** button ☒ .

3.6.1.2 Controls in Toolbar

The toolbar is displayed across the top of the application window, below the menu bar. The toolbar provides quick mouse access to many tools used in Application Builder.

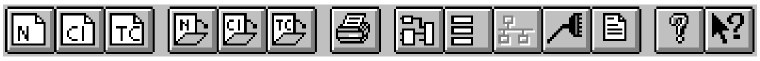


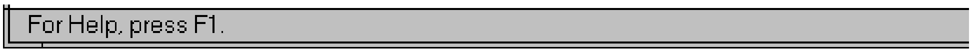
Figure 3-3. Toolbar

Toolbar buttons exist for the following commands:

- **File | New | Node**
- **File | New | Circuit**
- **File | New | Type Circuit**
- **File | Open | Node List**
- **File | Open | Circuit List**
- **File | Open | Type Circuit List**
- **File | Print**
- **Tools | Function Chart Builder**
- **Tools | Node Structure Function Chart Builder**
- **Tools | Bus Configuration Builder**
- **Tools | On-line Builder**
- **Tools | Text Editor**
- **Help | Contents**
- **Help | On Context**.

3.6.1.3 Indicators in Status Bar

The **Status Bar** is displayed at the bottom of the Application Builder window.



For Help, press F1.

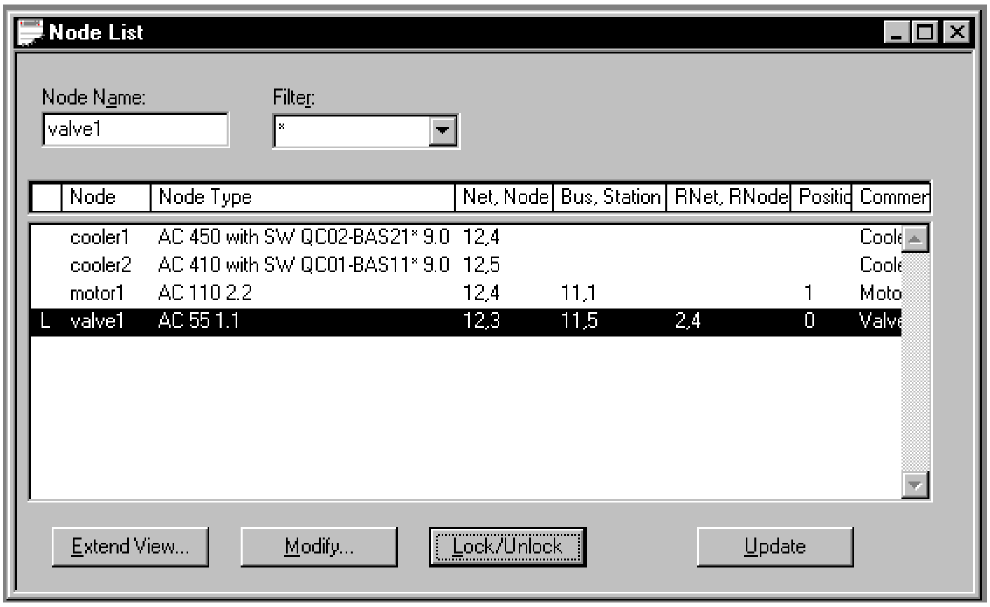
Figure 3-4. Status Bar

To hide or display the **Status Bar**, choose the **View | Status Bar** command.

The left area of the **Status Bar** describes actions of menu items as you use the ARROW keys to navigate through menus. This area similarly shows messages that describe the actions of toolbar buttons as you depress them, before releasing them. If after viewing the description of the toolbar button command you wish not to execute the command, then release the mouse button while the pointer is off the toolbar button.

3.6.2 Document Windows

3.6.2.1 Node List



Node Name: valve1

Filter: *

	Node	Node Type	Net, Node	Bus, Station	RNet, RNode	Positi	Commen
	cooler1	AC 450 with SW QC02-BAS21* 9.0	12,4				Coole
	cooler2	AC 410 with SW QC01-BAS11* 9.0	12,5				Coole
	motor1	AC 110 2.2	12,4	11,1		1	Moto
L	valve1	AC 55 1.1	12,3	11,5	2,4	0	Valv

Figure 3-5. Node List

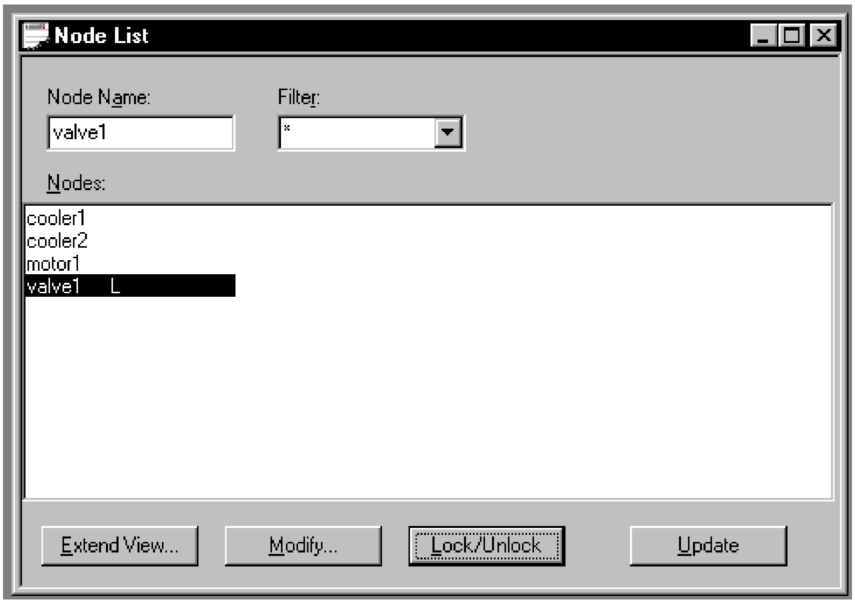
Opening

Use the **File | Open | Node List** command to open this document window. This command is available if a project is open.

Usage

Click with the right mouse button to get the context menu with the commands that are most relevant in that context.

If you have used the **View | Names Only** command in order to reduce the amount of information displayed for the existing nodes, then the **Node List** looks like this:



Node Name: valve1

Filter: *

cooler1
cooler2
motor1
valve1 L

Figure 3-6. Node List - Names Only

You can enter a node name or just select a node in the list. The filter function enables you to display a subset of the available nodes. Activate the filter function by pressing the ENTER key.

When you have selected a node (the node is displayed with inverse characters), you can start a tool in the **Tools** menu. You can also start a tool when you double-click on a node. A predefined tool will then be started, as you defined with the **Options | Assign Double-click** command.

All three document windows of Application Builder may be open at the same time and may have selected objects. Only the active document window with the selected object is relevant at a time.

If a node contains the marker "Invalid" instead of a node type designation use the **File | Modify** command to define a valid node type.

Locking

The first column on the left hand side shows an:

- "L" if the node is locked by this Application Builder
- "l" if the node is locked by another Application Builder in a network configuration.

See Section 3.5.8, Locking for more information.

Beside these entries another entry may appear: If the first column on the left hand side displays a "W" then Application Builder cannot read or handle the node-specific initialization file.

Reasons

The *.ini file is located on the same directory level as for example the SRCE directory of that object. The reasons for problems with the *.ini file can be of different kind:

- An *.ini file with missing information
- An *.ini file with wrong or invalid information
- A corrupt *.ini file, for example in consequence of a power failure.

Solutions

- Reproduce the original content of the *.ini file, if it was changed manually for any reason, or
- Copy the corresponding file from a backup, if available, or
- Create a similar object and copy the *.ini file from there (rename the file accordingly), or
- Create a new object (similar characteristics) and use the **File | Copy** command to copy the source only. For this check the check box source code only in the **Copy** dialog.

CAUTION

Only source code will be copied. If you have additional data, such as *.odb files (Function Chart Builder) or other user defined data and directories, you must copy them manually.

- Copy all relevant data manually to another object environment (for example, with Windows NT Explorer).

See also

Section 3.6.2.2, Extended View - for Nodes; Section 3.6.4.4, View | Names Only for information on how to change the displayed **Node List** contents.

Dialog Controls

Node Name

Displays the selected node name. You can also enter one of the node names of the list in this edit field. All tools remain disabled as long as no valid node name is entered in this edit field.

When you select more then one node, then the selected node names appear separated by a space. You can use this function for, for example the **File | Copy** command.

Filter

The filter function is useful to display a subset of the available nodes, for example if many nodes are available. The wild cards "?" (one character) and "*" (group of characters) are supported. The filter mask remains in the edit field until you change it.

Activate the filter function by pressing the ENTER key.

Node List

The **Node List** displays the existing nodes of a project alphabetically. If you use the filter function, the corresponding sub set of nodes is displayed only.

When you have selected a node (the node is displayed with inverse characters), you can start a tool in the **Tools** menu. When you double-click on a node, a tool will be started you defined in the **Options | Assign Double-click** command. When you double-click on an node of the list the first time after installation, then the **Options | Assign Double-click** dialog appears.
Use that dialog to predefine a tool, which shall start after a double-click.

You can use the F7 key and the ARROW keys to change the displayed information area if a node is selected:

1. Select a node (use the mouse or the TAB key),
2. Press the F7 key to activate the function,
3. Every time you press the F7 key the cursor jumps to the next border line,
4. Use the ARROW keys to change the space between two border lines.

You can change the displayed information area also using the mouse. Click on a border and drag the column line.

Net, Node

Here, net identifies the number of the MB 300 network. Node identifies the number of the Advant Controller 400 Series controller in an MB 300 network.

Bus, Station

Here, bus identifies the number of the Advant Fieldbus 100, station identifies the node in the Advant Fieldbus 100 network.

RNet, RNode

RNet is the remote network number of an RCOM network or a dial-up line using the RCOM protocol. RNode is the node in the RCOM network or a dial-up line.

Position

Position identifies the position of the CPU module in the rack for certain node types.

Extended View

When you click the **Extend View** button, then the **Extended View** dialog pops up (see Section 3.6.2.2, Extended View - for Nodes). Here you can access important files of the selected node with one of the tools (for example Function Chart Builder) or with an editor. The **Extend View** button is only active if a single node is selected.

Modify

When you click the **Modify** button, the **Modify** dialog pops up (see Section 3.6.3.21, File | Modify - for Node). The **Modify** button is only active if a single node is selected.

Lock/Unlock

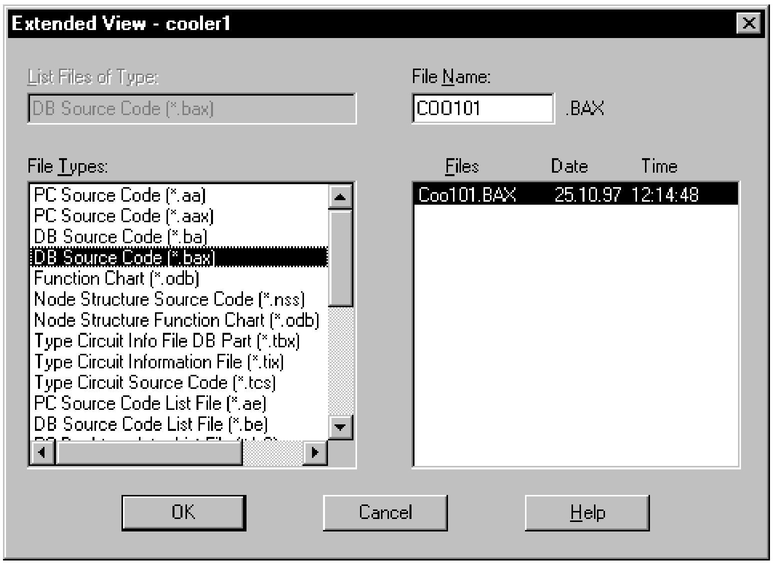
You can lock or unlock one or more nodes clicking this button. The state of a node is marked with the character "L" or "l" in the first column of that node. It is a toggle function.

Update

Use the **Update** button to update an already displayed list. This is useful especially for server installations.

3.6.2.2 Extended View - for Nodes

Use this dialog to access important files of the selected node with one of the tools (for example, Function Chart Builder) or with an editor:



Extended View - cooler1

List Files of Type: DB Source Code (*.bax)

File Name: C00101 .BAX

File Types: DB Source Code (*.bax)

Files	Date	Time
Coo101.BAX	25.10.97	12:14:48

PC Source Code (*.aa)
PC Source Code (*.aax)
DB Source Code (*.ba)
DB Source Code (*.bax)
Function Chart (*.odb)
Node Structure Source Code (*.nss)
Node Structure Function Chart (*.odb)
Type Circuit Info File DB Part (*.tbx)
Type Circuit Information File (*.tix)
Type Circuit Source Code (*.tcs)
PC Source Code List File (*.ae)
DB Source Code List File (*.be)
OK
Cancel
Help

Figure 3-7. Extended View Dialog for Nodes

Select a file type you are interested in (you can select only one file at a time). Then the actual files of that type will be displayed on the right hand side of the dialog. Each file type has a relation to a specific tool that starts when you click the **OK** button.

The **File Name** edit field supports a filter function. According to the filter mask a subset of the available files will be displayed.

The table below shows the available file types and the corresponding tools:

Table 3-3. Extended View File Types for Nodes

File Types	Tool
PC source code (*.aa)	Text editor
PC source code (*.aax)	Text editor
DB source code (*.ba)	Text editor
DB source code (*.bax)	Text editor
Function Chart (*.odb)	Function Chart Builder
Node Structure source code (*.nss)	Text editor
Node Structure Function Chart (*.odb)	Function Chart Builder
Type circuit information file DB part (*.tbx)	Text editor

Table 3-3. Extended View File Types for Nodes (Continued)

File Types	Tool
Type circuit information file (*.tix)	Text editor
Type circuit source code (*.tcs)	Text editor
PC source code list file (*.ae)	Text editor
DB source code list file (*.be)	Text editor
DB backtranslator list file (*.ls?)	Text editor
DB backtranslator error list (*.wex)	Text editor
PC backtranslator list file (*.ls?)	Text editor
PC backtranslator error list (*.wex)	Text editor
Node structure backtranslator list file (*.l??)	Text editor
Node structure backtranslator error list (*.wex)	Text editor
Type circuit instantiation list file (*.ls?)	Text editor
Type circuit instantiation error list (*.wex)	Text editor
List of incorrect type circuits (tcerrors.lis)	Text editor
Type circuit symbol information file (*.lis)	Text editor
List of incorrect circuits (cierrors.lis)	Text editor
Circuit symbol information file (*.lis)	Text editor
Target code generator list file for PC part (RETL????.C??)	Text editor
Target code generator list file for DB part (COTL????.C00)	Text editor
Bus Configuration Builder list file (*.c00)	Text editor
FCB Server Log File (<nodename>.log)	Text editor
Command file (*.cfx)	Text editor
Command file (*.cf)	Text editor

NOTE

PC and DB source code files in ABB Master representation (*.aa, *.ba) will be expanded automatically before the text editor is started.

Dialog Controls

List Files of Type

Displays the selected type of file.

File Name

The **File Name** edit field displays the selected file and supports a filter function. According to the filter mask a subset of the available files will be displayed. The wild cards “?” (one character) and “*” (group of characters) are supported.

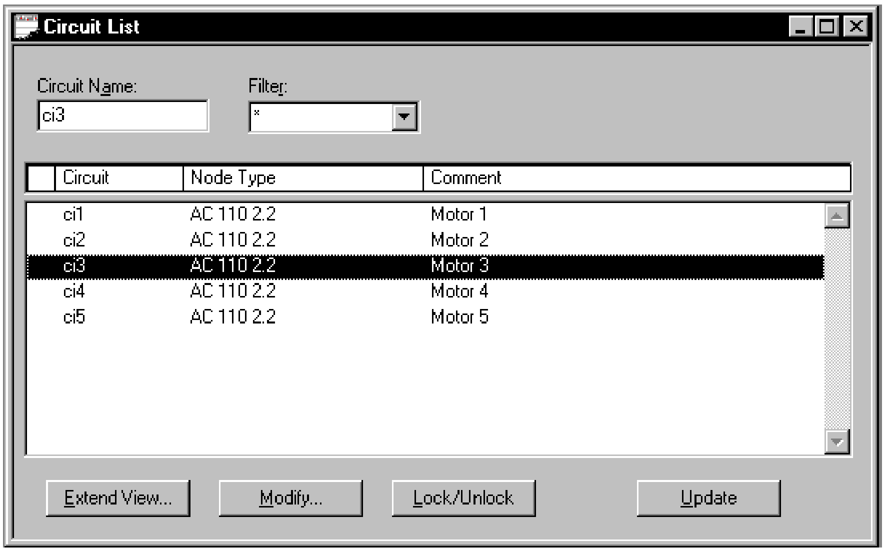
File Types

Select a file type you are interested in. Then the existing files of that type will be displayed on the right hand side of the dialog.

Files

Select one of the displayed files you want to work with. Double-click the file or click the **OK** button. The corresponding tool will be started.

3.6.2.3 Circuit List



Circuit Name: ci3

Filter: *

Circuit	Node Type	Comment
ci1	AC 110 2.2	Motor 1
ci2	AC 110 2.2	Motor 2
ci3	AC 110 2.2	Motor 3
ci4	AC 110 2.2	Motor 4
ci5	AC 110 2.2	Motor 5

Figure 3-8. Circuit List

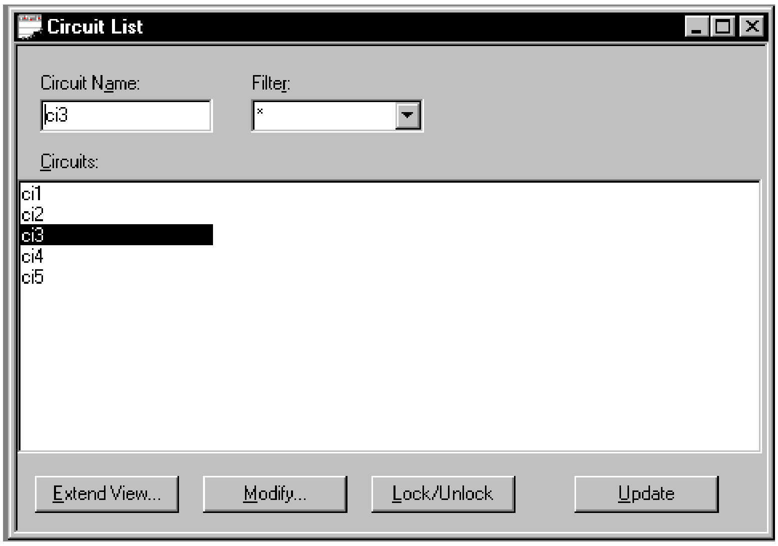
Opening

Use the **File | Open | Circuit List** command to open this document window. This command is available if a project is open.

Usage

Click with the right mouse button to get the context menu with the commands that are most relevant in that context.

If you have used the **View | Names Only** command in order to reduce the amount of information displayed for the existing circuits, then the **Circuit List** looks like this:



Circuit Name: ci3

Filter: *

Circuits:

ci1
ci2
ci3
ci4
ci5

Figure 3-9. Circuit List - Names Only

You can enter a circuit name or just select a circuit in the list. The filter function enables you to display a subset of the available circuits. Activate the filter function by pressing the ENTER key.

When you have selected a circuit (the circuit is displayed with inverse characters), you can start a tool in the **Tools** menu. You can also start a tool when you double-click on a circuit. A predefined tool will then be started, as you defined with the **Options | Assign Double-click** command.

All three document windows of Application Builder may be open at the same time and may have selected objects. Only the active document window with the selected object is relevant at a time.

If a circuit contains the marker "Invalid" instead of a node type designation use the **File | Modify** command to define a valid node type.

Locking

See in Section 3.6.2.1, Node List.

See also

Section 3.6.2.4, Extended View - for Circuits; Section 3.6.4.4, View | Names Only for information on how to change the displayed **Circuit List** contents.

Dialog Controls

Circuit Name

Displays the selected circuit name. You can also enter one of the circuit names of the list in this edit field. All tools remain disabled as long as no valid circuit name is entered in this edit field.

When you select more then one circuit, then the selected circuit names appear separated by a space. You can use this function for, for example the **File | Copy** command.

Filter

The filter function is useful to display a subset of the available circuits, for example if many circuits are available. The wild cards "?" (one character) and "*" (group of characters) are supported. The filter mask remains in the edit field until you change it.

Activate the filter function by pressing the ENTER key.

Circuit List

The **Circuit List** displays the existing circuits of a project alphabetically. If you use the filter function, the corresponding sub set of circuits is displayed only.

When you have selected a circuit (the circuit is displayed with inverse characters), you can start a tool in the **Tools** menu. When you double-click on a circuit, a tool will be started you defined in the **Options | Assign Double-click** command. When you double-click on an circuit of the list the first time after installation, then the **Options | Assign Double-click** dialog appears. Use that dialog to predefine a tool, which shall start after a double-click.

You can use the F7 key and the ARROW keys to change the displayed information area if a circuit is selected:

1. Select a circuit (use the mouse or the TAB key)
2. Press the F7 key to activate the function
3. Every time you press the F7 key the cursor jumps to the next border line
4. Use the ARROW keys to change the space between two border lines.

You can change the displayed information area also using the mouse. Click on a border and drag the column line.

Extended View

When you click the **Extend View** button, then the **Extended View** dialog pops up (see Section 3.6.2.4, Extended View - for Circuits). Here you can access important files of the selected circuit with one of the tools (for example Function Chart Builder) or with an editor. The **Extend View** button is only active if a single circuit is selected.

Modify

When you click the **Modify** button, the **Modify** dialog pops up (see Section 3.6.3.22, File | Modify - for Circuit/Type Circuit). The **Modify** button is only active if a single circuit is selected.

Lock/Unlock

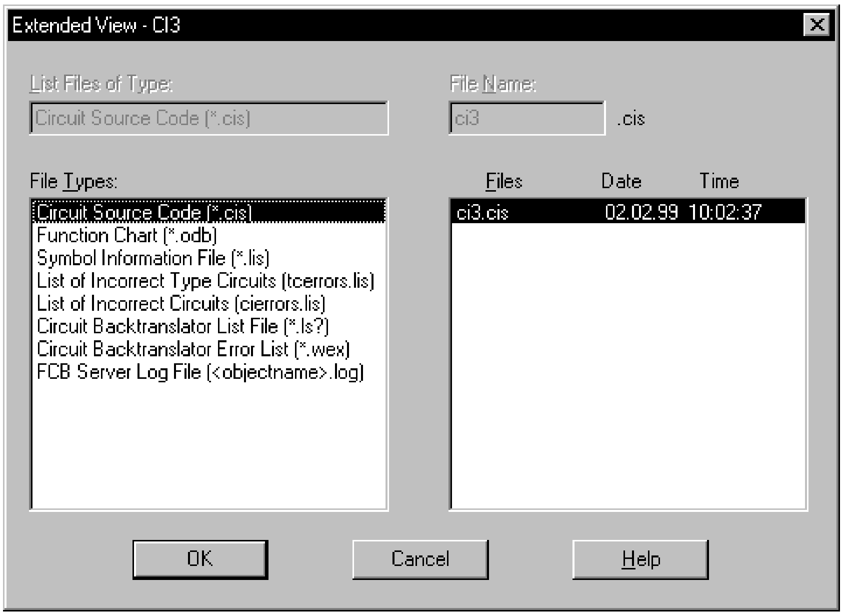
You can lock or unlock one or more nodes clicking this button. The state of a circuit is marked with the character "L" or "l" in the first column of that node. It is a toggle function.

Update

Use the **Update** button to update an already displayed list. This is useful especially for server installations.

3.6.2.4 Extended View - for Circuits

Use this dialog to access important files of the selected circuit with one of the tools (for example, Function Chart Builder) or with an editor:



Extended View - CI3

List Files of Type: Circuit Source Code (*.cis)

File Name: ci3 .cis

File Types:

- Circuit Source Code (*.cis)
- Function Chart (*.odb)
- Symbol Information File (*.lis)
- List of Incorrect Type Circuits (tcerrors.lis)
- List of Incorrect Circuits (cierrors.lis)
- Circuit Backtranslator List File (*.ls?)
- Circuit Backtranslator Error List (*.wex)
- FCB Server Log File (<objectname>.log)

Files	Date	Time
ci3.cis	02.02.99	10:02:37

Figure 3-10. Extended View Dialog for Circuits

Select a file type you are interested in (you can select only one file at a time). Then the actual files of that type will be displayed on the right hand side of the dialog. Each file type has a relation to a specific tool that starts when you click the **OK** button.

The **File Name** edit field supports a filter function. According to the filter mask a subset of the available files will be displayed.

The next table shows the available file types and the corresponding tools:

Table 3-4. Extended View File Types for Circuits

File Types	Tool
Circuit source code (*.cis)	Text editor
Function Chart (*.odb)	Function Chart Builder
Symbol information file (*.lis)	Text editor
List of incorrect type circuits (tcerrors.lis)	Text editor
List of incorrect circuits (cierrors.lis)	Text editor
Circuit backtranslator list file (*.ls?)	Text editor
Circuit backtranslator error list (*.wex)	Text editor
FCB Server Log File (<circuitname>.log)	Text editor

Dialog Controls

List Files of Type

Displays the selected type of file.

File Name

The **File Name** edit field displays the selected file and supports a filter function. According to the filter mask a subset of the available files will be displayed. The wild cards “?” (one character) and “*” (group of characters) are supported.

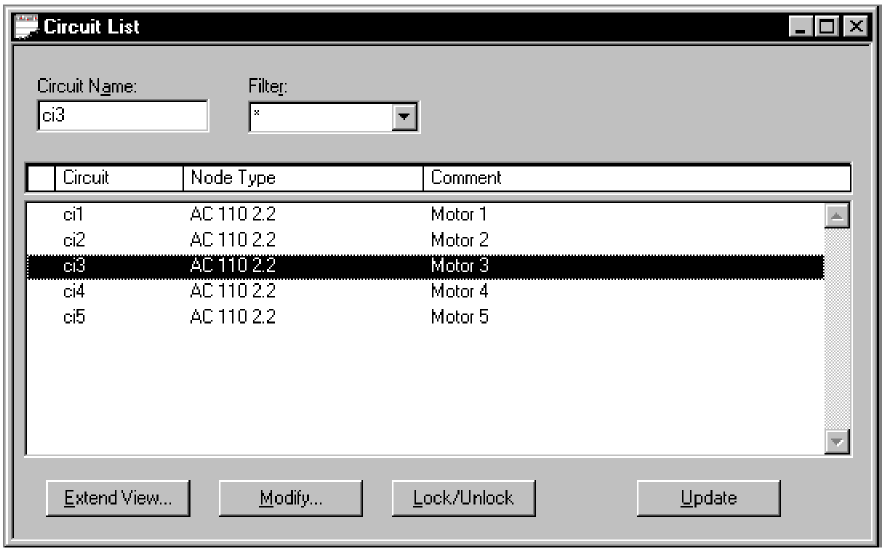
File Types

Select a file type you are interested in. Then the existing files of that type will be displayed on the right hand side of the dialog.

Files

Select one of the displayed files you want to work with. Double-click the file or click the **OK** button. The corresponding tool will be started.

3.6.2.5 Type Circuit List



Circuit Name: ci3

Filter: *

Circuit	Node Type	Comment
ci1	AC 110 2.2	Motor 1
ci2	AC 110 2.2	Motor 2
ci3	AC 110 2.2	Motor 3
ci4	AC 110 2.2	Motor 4
ci5	AC 110 2.2	Motor 5

Figure 3-11. Circuit List

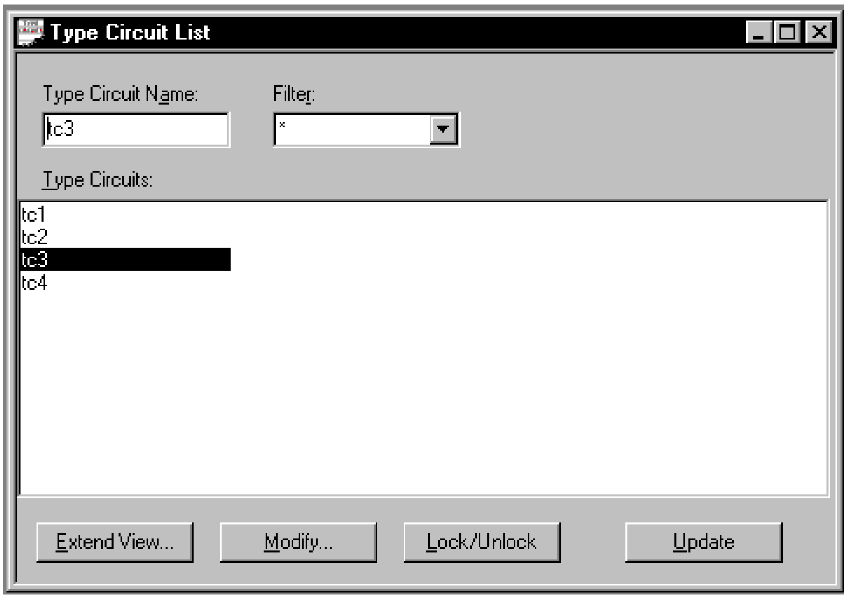
Opening

Use the **File | Open | Type Circuit List** command to open this document window. This command is available if a project is open.

Usage

Click with the right mouse button to get the context menu with the commands that are most relevant in that context.

If you have used the **View | Names Only** command in order to reduce the amount of information displayed for the existing type circuits, then the **Type Circuit List** looks like this:



Type Circuit Name: tc3

Filter: *

Type Circuits:
tc1
tc2
tc3
tc4

Figure 3-12. Type Circuit List - Names Only

You can enter a type circuit name or just select a type circuit in the list. The filter function enables you to display a subset of the available type circuits. Activate the filter function by pressing the ENTER key.

When you have selected a type circuit (the type circuit is displayed with inverse characters), you can start a tool in the **Tools** menu. You can also start a tool when you double-click on a type circuit. A predefined tool will then be started, as you defined it with the **Options | Assign Double-click** command.

All three document windows of Application Builder may be open at the same time and may have selected objects. Only the active document window with the selected object is relevant at a time.

If a type circuit contains the marker "Invalid" instead of a node type designation use the **File | Modify** command to define a valid node type.

Locking

See in Section 3.6.2.1, Node List.

See also

Section 3.6.2.6, Extended View - for Type Circuits; Section 3.6.4.4, View | Names Only for information on how to change the displayed **Type Circuit List** contents.

Dialog Controls

Type Circuit Name

Displays the selected type circuit name. You can also enter one of the type circuit names of the list in this edit field. All tools remain disabled as long as no valid type circuit name is entered in this edit field.

When you select more then one type circuit, then the selected type circuit names appear separated by a space. You can use this function for, for example, the **File | Copy** command.

Filter

The filter function is useful to display a subset of the available type circuits, for example if many type circuits are available. The wild cards "?" (one character) and "*" (group of characters) are supported. The filter mask remains in the edit field until you change it.

Activate the filter function by pressing the ENTER key.

Type Circuit List

The **Type Circuit List** displays the existing type circuits of a project alphabetically. If you use the filter function, the corresponding sub set of type circuits is displayed only.

When you have selected a type circuit (the type circuit is displayed with inverse characters), you can start a tool in the **Tools** menu. When you double-click on a type circuit, a tool will be started you defined in the **Options | Assign Double-click** command. When you double-click on a type circuit of the list the first time after installation, then the **Options | Assign Double-click** dialog appears. Use that dialog to predefine a tool, which shall start after a double-click.

You can use the F7 key and the ARROW keys to change the displayed information area if a type circuit is selected:

1. Select a type circuit (use the mouse or the TAB key).
2. Press the F7 key to activate the function.
3. Every time you press the F7 key the cursor jumps to the next border line.
4. Use the ARROW keys to change the space between two border lines.

You can change the displayed information area also using the mouse. Click on a border and drag the column line.

Extended View

When you click the **Extend View** button, then the **Extended View** dialog pops up (see Section 3.6.2.6, Extended View - for Type Circuits). Here you can access important files of the selected type circuit with one of the tools (for example Function Chart Builder) or with an editor. The **Extend View** button is only active if a single type circuit is selected.

Modify

When you click the **Modify** button, the **Modify** dialog pops up (Section 3.6.3.22, File | Modify - for Circuit/Type Circuit). The **Modify** button is only active if a single type circuit is selected.

Lock/Unlock

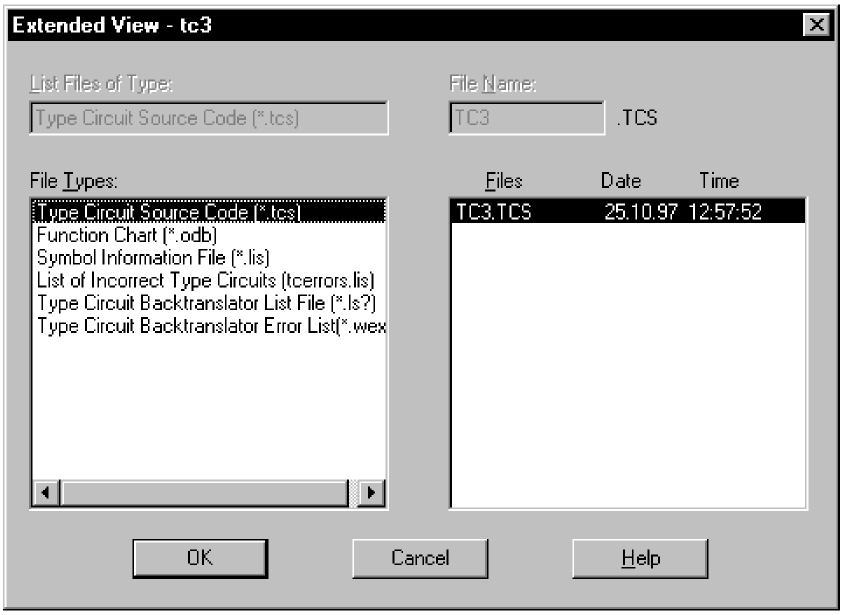
You can lock or unlock one or more type circuits clicking this button. The state of a type circuit is marked with the character "L" or "l" in the first column of that node. It is a toggle function.

Update

Use the **Update** button to update an already displayed list. This is useful especially for server installations.

3.6.2.6 Extended View - for Type Circuits

Use this dialog to access important files of the selected type circuit with one of the tools (for example, Function Chart Builder) or with an editor:



Extended View - tc3

List Files of Type: Type Circuit Source Code (*.tcs)

File Name: TC3 .TCS

Files	Date	Time
TC3.TCS	25.10.97	12:57:52

File Types:
Type Circuit Source Code (*.tcs)
Function Chart (*.odb)
Symbol Information File (*.lis)
List of Incorrect Type Circuits (tcerrors.lis)
Type Circuit Backtranslator List File (*.ls?)
Type Circuit Backtranslator Error List(*.wex
OK
Cancel
Help

Figure 3-13. Extended View Dialog for Type Circuits

Select a file type you are interested in (you can select only one file at a time). Then the actual files of that type will be displayed on the right hand side of the dialog. Each file type has a relation to a specific tool that starts when you click the **OK** button.

The **File Name** edit field supports a filter function. According to the filter mask a subset of the available files will be displayed.

The table below shows the available file types and the corresponding tools:

Table 3-5. Extended View File Types for Type Circuits

File Types	Tool
Type circuit source code (*.cis)	Text editor
Function Chart (*.odb)	Function Chart Builder
Symbol information file (*.lis)	Text editor
List of incorrect type circuits (tcerrors.lis)	Text editor
Type circuit backtranslator list file (*.ls?)	Text editor
Type circuit backtranslator error list (*.wex)	Text editor

Dialog Controls

List Files of Type

Displays the selected type of file.

File Name

The File Name edit field displays the selected file and supports a filter function. According to the filter mask a subset of the available files will be displayed. The wild cards "?" (one character) and "*" (group of characters) are supported.

File Types

Select a file type you are interested in. Then the existing files of that type will be displayed on the right hand side of the dialog.

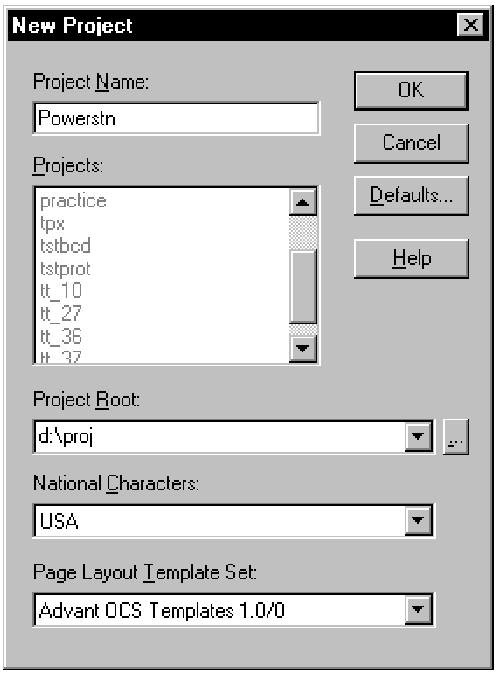
Files

Select one of the displayed files you want to work with. Double-click the file or click the **OK** button. The corresponding tool will be started.

3.6.3 File Menu

3.6.3.1 File | New | Project

Use this command (always available) to generate a new project.



New Project

Project Name: Powerstn

Projects:
- practice
- tpx
- tstbcd
- tstprot
- tt_10
- tt_27
- tt_36
- tt_37

Project Root: d:\proj

National Characters: USA

Page Layout Template Set: Advant OCS Templates 1.0/0

Figure 3-14. New Project Dialog

When a new project is generated, an already open project is closed automatically, because working is allowed only with one project. You can choose an existing project root or you can create a new root, which becomes then an entry of the **Project Root** list box.

Dialog Controls

Project Name

Enter a valid, non existing project name. The maximum length is eight characters (a..z, A..Z, 0..9, and "_").

Projects

All existing projects under the selected project root are listed here.

Project Root

For the new project you can decide on which project root the project shall be generated. You can choose an existing root or you can create a new root, which becomes then an entry of the **Project Root** list box. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:

‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.

Other characters may be invalid depending on the file system.

National Characters

The **National Characters** list box is used for the national character conversion of the 7-bit ASCII source code. The choice of the national characters is fixed for the project and cannot be changed.

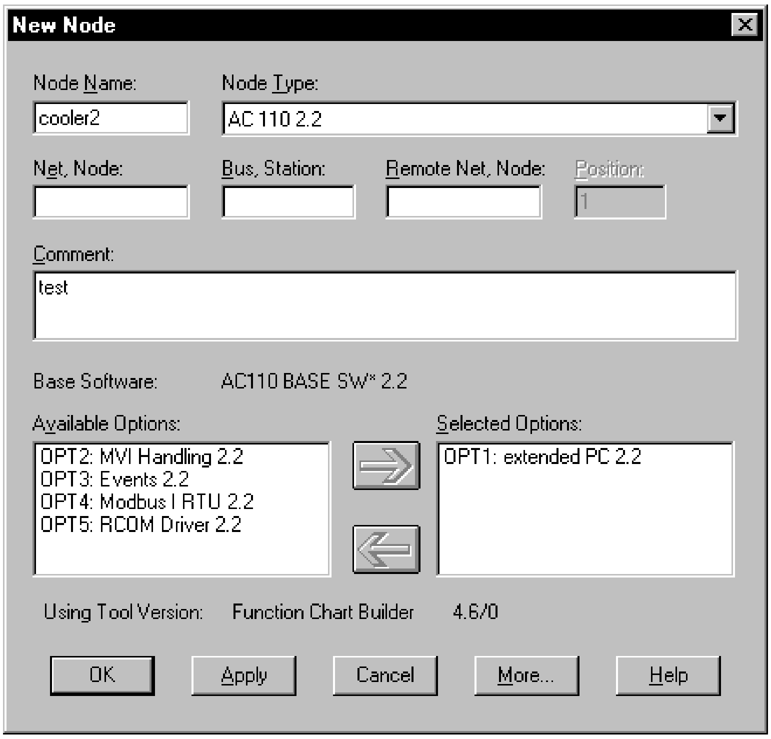
Page Layout Template Set

The **Page Layout Template Set** list box is used to select a set of templates you want to use in a project. A set consists of several templates of different type, like portrait or landscape, letter, legal, and so on (see Section 3.6.3.32, File | Page Setup). The template sets are stored in files on the `C:\Advabldenv` directory. Different sets, which may be adapted to special needs of a project, may be available in the **Page Layout Template Set** list box. The choice of the template set is fixed for the project.

See example in Section 3.5.2, Usage of Page Layout Templates.

3.6.3.2 File | New | Node

Use the **File | New | Node** command to generate a new node.



Node Name: cooler2

Node Type: AC 110 2.2

Position: 1

Comment: test

Base Software: AC110 BASE SW* 2.2

Available Options:
- OPT2: MVI Handling 2.2
- OPT3: Events 2.2
- OPT4: Modbus I RTU 2.2
- OPT5: RCOM Driver 2.2

Selected Options:
- OPT1: extended PC 2.2

Using Tool Version: Function Chart Builder 4.6/0

Figure 3-15. New Node Dialog

You can enter a name for the new node and choose a node type. The default node type is selected (see Section 3.6.5.1, Options | Project Defaults). Dependent on the selected node type enter a net, node address and—if necessary for the selected node type—a bus, station, remote net, remote node, and position address in addition. .

Using the **Apply** button leaves the dialog open and changes the **Cancel** button label into **Close** (you cannot undo any creation process in this dialog). Then you have the possibility to generate some more nodes.

After creating a new node the **Node List** pops up automatically (when it was closed before) and the new node is inserted in the list.

When creating a new object, the tool version is automatically assigned to this object. You can change the tool version manually with the **More** button or the **File | Modify** command. See also Section 3.6.3.4, Select Tool Versions Dialog.

The **File | New | Node** command is available if a project is open.

Shortcut

Toolbar:

Dialog Controls

Node Name

Enter a name for the node in this edit field. The maximum length is eight characters (a..z, A..Z, 0..9, and "_").

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name.

If you have defined a default node type with the **Option | Project Defaults** command, then this node type is selected per default and the defined tool versions will be assigned for the new node, circuit, or type circuit.

NOTE

When you change the default node type or if no default versions are defined, then always the latest tool versions are used.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Net, Node

For some node types enter a valid and unique net and node number.

Bus, Station

For some node types a bus and station identification is necessary in addition. Enter a valid and unique bus and station number. This edit field is dimmed, if this identification is not necessary for the selected node type.

Remote Net, Node

For some node types a remote net and remote node identification is necessary in addition, for example an RCOM address. Enter a valid remote net and remote node number. This edit field is dimmed, if this identification is not necessary for the selected node type.

Position

For some node types a position identification is necessary. This edit field is dimmed and empty, if this identification is not necessary for the selected node type. It is dimmed and contains a predefined position number for certain node types. In such cases you cannot change the position as the predefined position is the only valid one.

If the edit field is not dimmed, enter a valid position number.

Comment

You can enter a comment with up to 132 characters.

Base Software

The base software is the necessary software of the selected node type. In addition to the base software you can select options, which extend the functionality performed by the base software of that node type.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options. You can add or remove options. Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. You may get a message that Function Chart Builder must reinitialize the object when changing options.

Using Tool Version

This is the current Function Chart Builder version assigned to the node.

Apply

If you want to create more than one node, then you have the opportunity to use the **Apply** button in order to create a new node but leave the dialog open. The **Cancel** button changes then to a **Close** button (you cannot undo any creation process in this dialog).

More

When you click the **More** button, then the **More Settings** dialog pops up. Here you can change tool versions, document texts, and page setup. See Section 3.6.3.4, Select Tool Versions Dialog for a description of the dialog.

3.6.3.3 More Settings Dialog

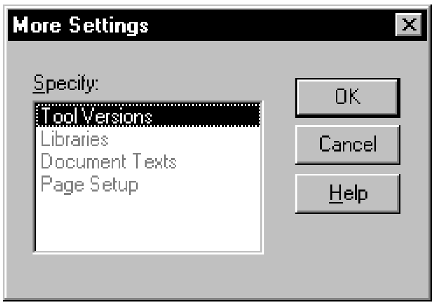


Figure 3-16. More Settings Dialog

Use this dialog box to define tool versions, libraries, document texts (footers), and page layout to be used with the project.

The items **Tool Versions**, **Document Texts**, and **Page Setup** are enabled when opening the dialog via the **Options | Project Defaults** dialog.

When creating an object, only the item **Tool Versions** is disabled.

When modifying a node, the items **Tool Versions** and **Libraries** are enabled.

Choose one of the entries and click **OK**.

Dialog Controls

Tool Versions

When you double-click this item, then the **Tool Versions** dialog pops up
(see Section 3.6.3.4, Select Tool Versions Dialog).
Here you can select a version of Function Chart Builder.

Libraries

When you double-click this item, the Function Chart Builder Libraries dialog pops up
(see Section 3.6.3.5, Function Chart Builder Libraries Dialog).
Here you can select the libraries used by Function Chart Builder.

Document Texts

This control is only enabled when opening the **More Settings** dialog via the **Options | Project Defaults** dialog.

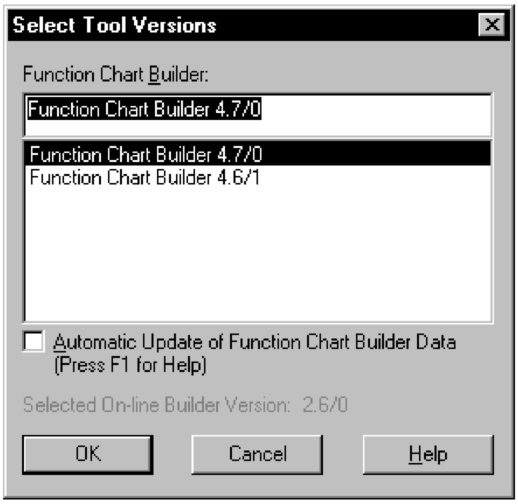
When you double-click this item, the **Document Texts** dialog pops up (see Section 3.6.3.6, Edit Document Texts). Here you can define the document texts. This control is disabled if no template has been selected via the **Page Setup** dialog.

Page Setup

This control is disabled. It is enabled when you use the **Options | Project Defaults** dialog. When you double-click this item, then the **Page Setup** dialog pops up (see Section 3.6.3.32, File | Page Setup). Here you can choose a layout template and set the page size for your diagrams.

3.6.3.4 Select Tool Versions Dialog

Use this dialog to select another version of Function Chart Builder. The dialog consists of a list box for the Function Chart Builder and a display of the On-line Builder version.



Function Chart Builder 4.7/0

Function Chart Builder 4.7/0
Function Chart Builder 4.6/1

☐ Automatic Update of Function Chart Builder Data (Press F1 for Help)

Selected On-line Builder Version: 2.6/0

Figure 3-17. Select Tool Versions Dialog

All installed Function Chart Builder versions are displayed. Function Chart Builder versions that are not compatible with the selected node type or the currently used Application Builder Version are disabled (grayed). Different reasons apply for disabled Function Chart Builder versions.

A Function Chart Builder version is disabled for selection if:

- The node type is not supported by that Function Chart Builder version.
- That Function Chart Builder version needs a newer Application Builder version than the currently used Application Builder version. The reason for this is, that a new Function Chart Builder version may not be compatible with an older Application Builder version.
- You want to modify the Function Chart Builder version via the **File | Modify** command and the Function Chart Builder version assigned to the selected node, type circuit, or circuit is not installed any more. In this case this Function Chart Builder version is displayed (grayed) on top position of the list box.

You can leave the dialog clicking the **OK** button only if a enabled version is selected.

NOTE

You cannot change the On-line Builder version.

Dialog Controls

Function Chart Builder versions

The default cursor position is the selected version.

Automatic Update of Function Chart Builder Data

This check box is only available if you modify the Function Chart Builder version for one selected object.

If you change the tool version for an object, you have to update its internal data representation (*.ODB file).

Select this check box to update the internal data representation (*.ODB file) of the object automatically, in the same way as by the File | Update FCB Data | Selected command.

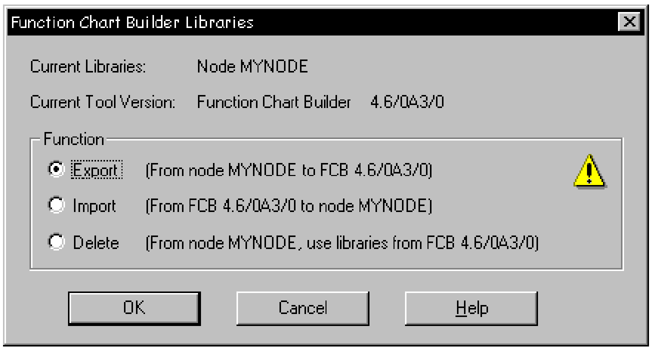
Unselect this check box if you want to update the internal data representation manually, by generating source code from the old *.ODB with the old Function Chart Builder version and backtranslating the source code with the new Function Chart Builder version to a new *.ODB.

NOTE

> The automatic update covers Function Chart Builder versions 4.6/*, 4.7/*, and higher. That means, you can use the **File | Modify** command for upgrading *.ODB files from 4.6/0 to 4.7/0, also for “downgrading” from FCB 4.7 to 4.6/1, but not for upgrading from 4.5/0 to 4.6/1.

3.6.3.5 Function Chart Builder Libraries Dialog

Use this dialog to change the usage of Function Chart Builder Libraries.



Current Libraries: Node MYNODE

Current Tool Version: Function Chart Builder 4.6/0A3/0

● Export (From node MYNODE to FCB 4.6/0A3/0)

○ Import (From FCB 4.6/0A3/0 to node MYNODE)

○ Delete (From node MYNODE, use libraries from FCB 4.6/0A3/0)

Figure 3-18. Function Chart Builder Libraries Dialog

Click **OK** to activate the selected function.

If you selected the Export or Import function, it may take a few seconds to compile the libraries.

Dialog Controls

Current Libraries

Displays the current level of libraries.

Current Tool Version

Displays the current Function Chart Builder version.

Export

Select the **Export** function to copy the libraries from the node to the Function Chart Builder version. The libraries on the node are deleted implicitly if you allow to delete them.

NOTE

> If the library that is exported already exists in Function Chart Builder, it may affect all nodes, circuits, and type circuits using that library. You may need to initialize your data for those nodes, circuits, and type circuits. On-line changes may no longer be possible. Your current node is not affected.

Import

Select the **Import** function to copy the libraries from Function Chart Builder to the node.

NOTE

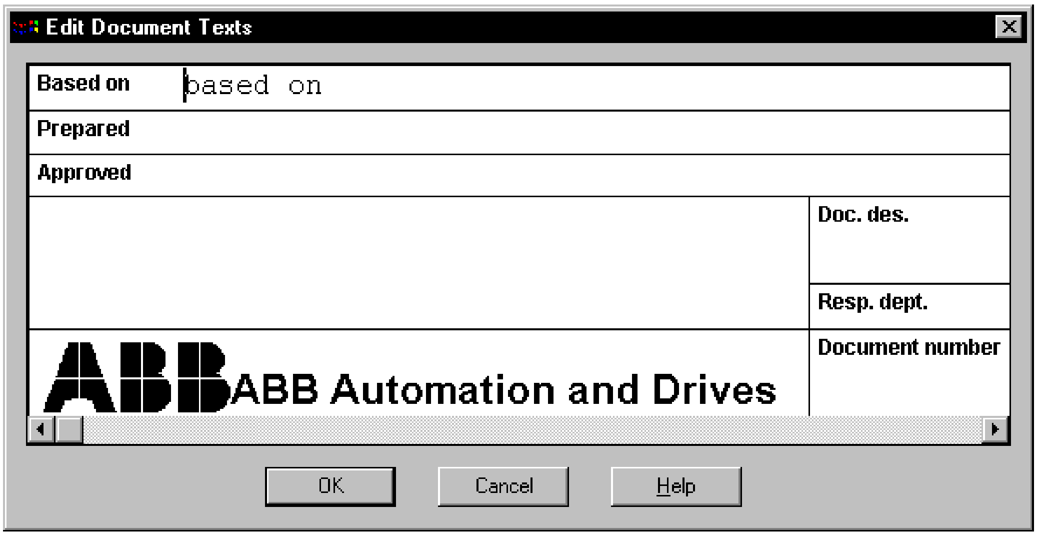
If the library already exists on the node it is overwritten. You may need to initialize your data for this node, on-line changes may no longer be possible. Other nodes are not affected.

Delete

Select the **Delete** function to delete the libraries from the node and use the libraries of Function Chart Builder. You may need the function if you selected not to delete the libraries when exporting them.

3.6.3.6 Edit Document Texts

Use this dialog to specify the text fields of the document texts.



Based on: based on

Figure 3-19. Edit Document Texts Dialog

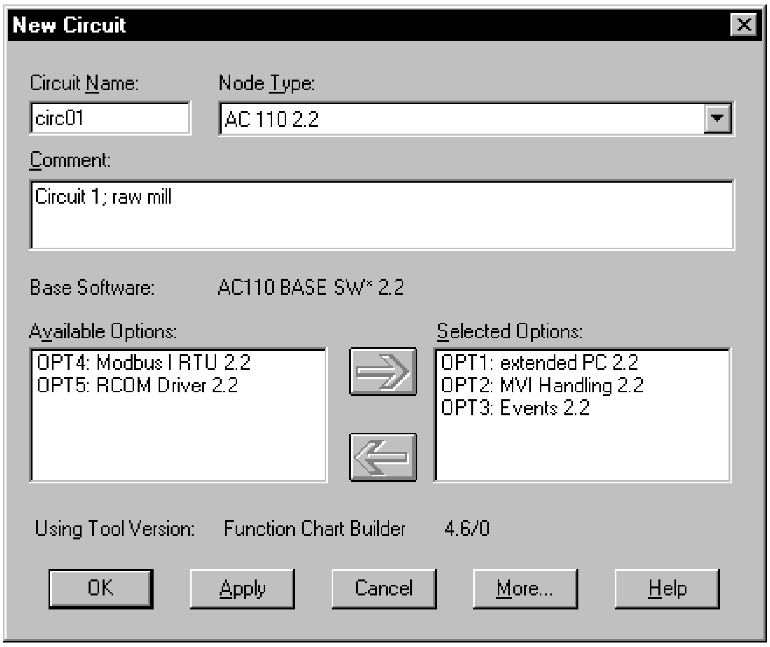
Document texts appear at the bottom of each page of the documentation. The dialog box shows only a part of the document texts, use the scroll box to see the other parts of it.

Press TAB or SHIFT+TAB (for the reverse direction) to move the cursor to the text fields of the template and type the text you wish to appear in the document texts.

You can select another layout template using the **File | Page Setup** command (see Section 3.6.3.32, File | Page Setup).

3.6.3.7 File | New | Circuit

Use this command to generate a new circuit.



New Circuit

Circuit Name: circ01

Node Type: AC 110 2.2

Comment: Circuit 1; raw mill

Base Software: AC110 BASE SW* 2.2

Available Options:
OPT4: Modbus I RTU 2.2
OPT5: RCOM Driver 2.2

Selected Options:
OPT1: extended PC 2.2
OPT2: MVI Handling 2.2
OPT3: Events 2.2

Using Tool Version: Function Chart Builder 4.6/0

Figure 3-20. New Circuit Dialog

You can enter a name for the new circuit and choose a node type. The default node type is selected (see Section 3.6.5.1, Options | Project Defaults).

Using the **Apply** button leaves the dialog open and changes the **Cancel** button label into **Close** (you cannot undo any creation process in this dialog). Then you have the possibility to generate some more circuits. When the dialog closes, the button label will be reset to Cancel for the next time the dialog box appears.

After creating a new circuit the **Circuit List** pops up automatically (when it was closed before) and the new circuit is inserted in the list.

When creating a new object, the tool version is automatically assigned to this object. You can change the tool version manually with the **More** button or the **File | Modify** command. See also Section 3.6.3.4, Select Tool Versions Dialog.

The **File | New | Circuit** command is available if a project is open.

Shortcut

Toolbar:

Dialog Controls

Circuit Name

Enter a name for the circuit in this edit field. The maximum length is eight characters (a..z, A..Z, 0..9, and "_").

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name.

If you have defined a default node type with the **Option | Project Defaults** command, then this node type is selected per default and the defined tool versions will be assigned for the new node, circuit, or type circuit.

NOTE

> When you change the default node type or if no default versions are defined, then always the latest tool versions are used.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Comment

You can enter a comment with up to 132 characters.

Base Software

The base software is the necessary software of the selected node type. In addition to the base software you can select options, which extend the functionality performed by the base software of that node type.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options. You can add or remove options. Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. You may get a message that Function Chart Builder must reinitialize the object when changing options.

Using Tool Version

This is the current Function Chart Builder version assigned to the circuit.

Apply

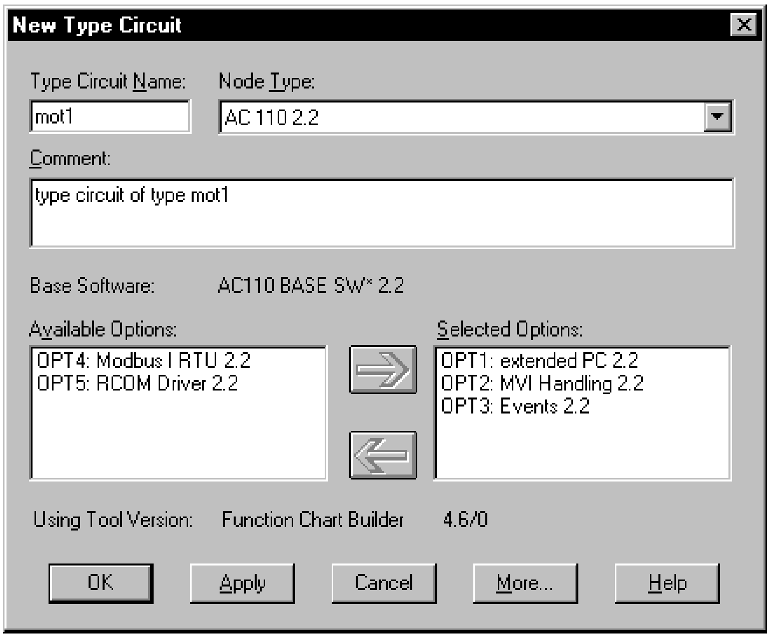
If you want to create more than one circuit, then you have the opportunity to use the **Apply** button in order to create a new circuit but leave the dialog open. The **Cancel** button changes then to a **Close** button (you cannot undo any creation process in this dialog).

More

When you click the **More** button, then the **More Settings** dialog pops up. Here you can change tool versions, document texts, and page setup. See Section 3.6.3.4, Select Tool Versions Dialog for a description of the dialog.

3.6.3.8 File | New | Type Circuit

Use this command to generate a new type circuit.



Type Circuit Name: mot1
Node Type: AC 110 2.2
Comment: type circuit of type mot1
Base Software: AC110 BASE SW* 2.2
Available Options:
OPT4: Modbus I RTU 2.2
OPT5: RCOM Driver 2.2
Selected Options:
OPT1: extended PC 2.2
OPT2: MVI Handling 2.2
OPT3: Events 2.2
Using Tool Version: Function Chart Builder 4.6/0

Figure 3-21. New Type Circuit Dialog

You can enter a name for the new type circuit and choose a node type. The default node type is selected (see Section 3.6.5.1, Options | Project Defaults).

Using the **Apply** button leaves the dialog open and changes the **Cancel** button label into **Close** (you cannot undo any creation process in this dialog). Then you have the possibility to generate some more type circuits. When the dialog closes, the button label will be reset to Cancel for the next time the dialog box appears.

After creating a new type circuit the **Type Circuit List** pops up automatically (when it was closed before) and the new type circuit is inserted in the list.

When creating a new object, the tool version is automatically assigned to this object. You can change the tool version manually with the **More** button or the **File | Modify** command. See also Section 3.6.3.4, Select Tool Versions Dialog.

The **File | New | Type Circuit** command is available if a project is open.

Shortcut

Toolbar: TC

Dialog Controls

Type Circuit Name

Enter a name for the type circuit in this edit field. The maximum length is eight characters (a..z, A..Z, 0..9, and "_").

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name.

If you have defined a default node type with the **Option | Project Defaults** command, then this node type is selected per default and the defined tool versions will be assigned for the new node, circuit, or type circuit.

NOTE

> When you change the default node type or if no default versions are defined, then always the latest tool versions are used.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Comment

You can enter a comment with up to 132 characters.

Base Software

The base software is the necessary software of the selected node type. In addition to the base software you can select options, which extend the functionality performed by the base software of that node type.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options. You can add or remove options. Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. You may get a message that Function Chart Builder must reinitialize the object when changing options.

Using Tool Version

This is the current Function Chart Builder version assigned to the type circuit.

Apply

If you want to create more than one type circuit, then you have the opportunity to use the **Apply** button in order to create a new type circuit but leave the dialog open. The **Cancel** button changes then to a **Close** button (you cannot undo any creation process in this dialog).

More

When you click the **More** button, then the **More Settings** dialog pops up. Here you can change tool versions, document texts, and page setup. See Section 3.6.3.4, Select Tool Versions Dialog for a description of the dialog.

3.6.3.9 File | Open | Project

Use the **File | Open | Project** command (always available) to open a project.

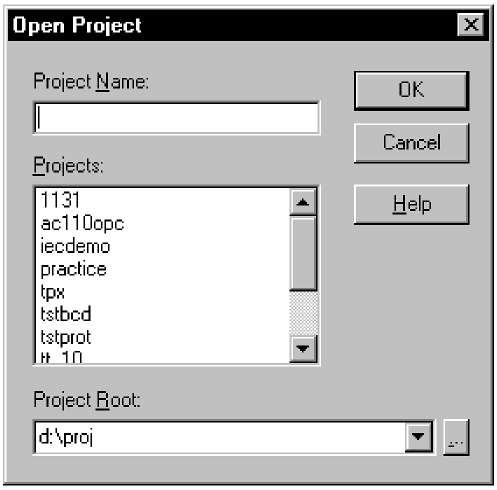


Figure 3-22. Open Project Dialog

Choose an existing project from the **Projects** list box and click **OK**. If necessary, you can change the project root in the related list box. An already open project is closed before the next project will be opened and the title of the application window will change the project name.

Dialog Controls

Project Name

You can enter a project name. The project name may contain wild cards ("*", "?"), which activates a filter function. The filter function reduces the amount of the displayed project entries in the list box. You can click alternatively on a project in the **Projects** list box, then the name appears in the **Project Name** edit field.

Projects

All existing projects are displayed here. If you have used a wild card ("*", "?"), then the remaining projects are displayed. You can click on a project, then the name appears in the project name edit field.

Project Root

Displays the current project root. You can choose another project root in the list. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:
‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.
Other characters may be invalid depending on the file system.

3.6.3.10 File | Open | Node List

Use this command to open the node list. The command is available if a project is open.

Shortcut

Toolbar: N

3.6.3.11 File | Open | Circuit List

Use this command to open the circuit list. The command is available if a project is open.

Shortcut

Toolbar: CL

3.6.3.12 File | Open | Type Circuit List

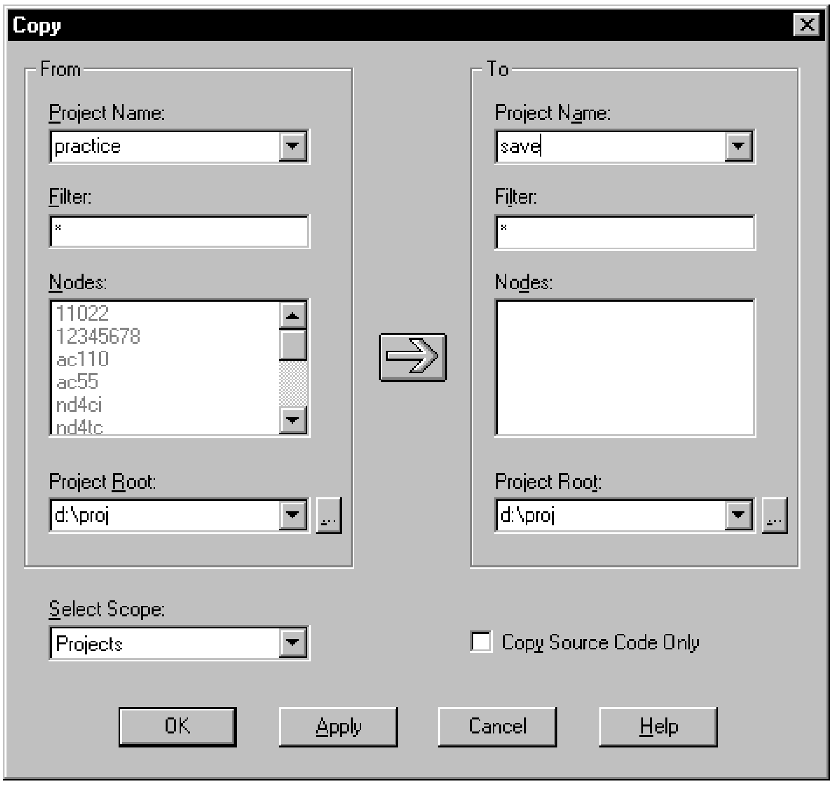
Use this command to open the type circuit list. The command is available if a project is open.

Shortcut

Toolbar: TC

3.6.3.13 File | Copy - for Projects

Use this command to copy application data from a project environment.



Copy

From

Project Name: practice

Filter: *

Nodes:
11022
12345678
ac110
ac55
nd4ci
nd4tc

Project Root: d:\proj

To

Project Name: save

Filter: *

Nodes:

Project Root: d:\proj

Select Scope: Projects

☐ Copy Source Code Only

Figure 3-23. Copy Projects Dialog

NOTE

You cannot copy a project to an existing project. Otherwise you would loose the already existing data on the destination project. Therefore you have to define a new unique name for the destination project.

Dialog Controls

Select Scope

Select "Projects" from the **Select Scope** list box to copy a project.

Project Name (From)

Select a project name from the list box to be the source project. You can alternatively enter the name of a project.

Filter

You can insert a filter for the nodes you want to be displayed. The filter can be any letter, number, underscore or a wild card (“*”: a number of characters; “?”: one character).

Project Root (From)

Select a project root from the list box to be the source root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\servername\sharename`.

Invalid characters in project root:
‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.
Other characters may be invalid depending on the file system.

Project Name (To)

Enter a new project name to be the destination project.

Project Root (To)

Select a project root from the list box to be the destination root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Copy Source Code Only

Check the check box **Copy Source Code Only** if you want to copy only the source code files of the selected project. The following files are concerned:

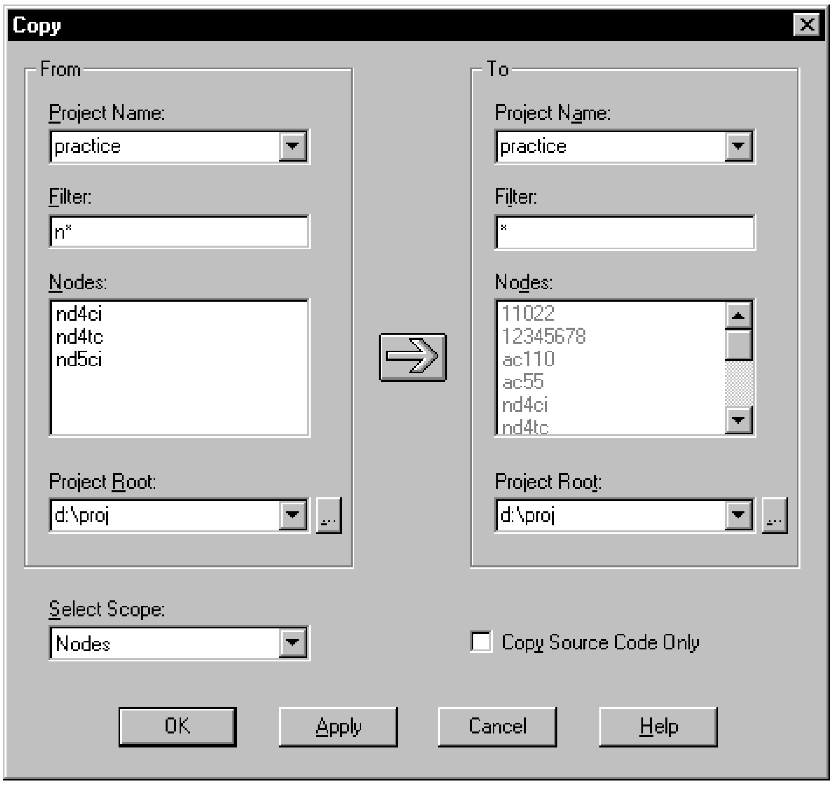
- Node files: *.AAX, *.AA, *.BAX, *.BA, *.TIX, *.TI, *.TBX, *.TB, *.TCS, *.TC, *.NSS
- Type circuit files: *.TCS
- Circuit specific files: *.CIS
- DB and PC Element Libraries on the node, see Section 3.5.7, Usage of AMPL PC and DB Element Libraries.

Buttons

Click the **Apply** button or the **arrow** button in the middle of the **Copy** dialog to start to copy. The dialog remains open and you can perform another operation. Click on the **OK** button if you want to close the dialog directly after copying. When using the **Apply** button or the **arrow** button, then the **Cancel** button changes to **Close** button.

3.6.3.14 File | Copy - for Nodes

Use this command to copy application data from a node environment.



From
Project Name: practice
Filter: n*
Nodes:
nd4ci
nd4tc
nd5ci
Project Root: d:\proj

To
Project Name: practice
Filter: *
Nodes:
11022
12345678
ac110
ac55
nd4ci
nd4tc
Project Root: d:\proj

Select Scope: Nodes

☐ Copy Source Code Only

Figure 3-24. Copy Nodes Dialog

When you start the copy procedure and you have selected one node only, the **Copy - Set Destination Name** dialog will be displayed and you can change the destination name (see Section 3.6.3.15, Copy - Set Destination Name Dialog).

When you click the **OK** button, the copy procedure starts.

NOTE

All files and directories of the source node are copied to the destination node (also the files and directories in the node that you may have created in addition). A node can also be copied if the destination project does not exist. The new project will be created if you confirm it.

Dialog Controls

Select Scope

Select "Nodes" from the **Select Scope** list box to copy nodes.

Project Name (From)

Select a project name from the list box to be the source project. You can alternatively enter the name of a project.

Filter

You can insert a filter for the nodes you want to be displayed. The filter can be any letter, number, underscore or a wild card ("*": a number of characters; "?": one character).

Nodes

Select one ore more nodes from the list box you want to copy. If you have selected more than one node the destination node names will be the same as the source node names.

If you decided to copy one node only, the **Copy - Set Destination Name** dialog box appears, where you can edit the destination node name. See Section 3.6.3.15, Copy - Set Destination Name Dialog.

Project Root (From)

Select a project root from the list box to be the source root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:
' ' (space), '@', ',', '!', '<', '>', '|'.
Other characters may be invalid depending on the file system.

Project Name (To)

Select a project name from the list box to be the destination project. You can alternatively enter the name of a project.

Project Root (To)

Select a project root from the list box to be the destination root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Copy Source Code Only

Check the check box **Copy Source Code Only** if you want to copy only the source code files of the selected project. The following files are concerned:

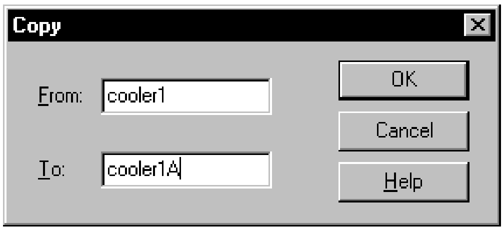
- Node files: *.AAX, *.AA, *.BAX, *.BA, *.TIX, *.TI, *.TBX, *.TB, *.TCS, *.TC, *.NSS
- DB and PC Element Libraries on the node, see Section 3.5.7, Usage of AMPL PC and DB Element Libraries.

Buttons

Click the **Apply** button or the **arrow** button in the middle of the **Copy** dialog to start to copy. The dialog remains open and you can perform another operation. Click on the **OK** button if you want to close the dialog directly after copying. When using the **Apply** button or the **arrow** button, then the **Cancel** button changes to **Close** button.

3.6.3.15 Copy - Set Destination Name Dialog

When you start the copy procedure and you have selected only one node, type circuit, or circuit, the **Set Destination Name** dialog will be displayed and you can change the destination name.



From: cooler1

To: cooler1A

Figure 3-25. Copy From... To... Dialog

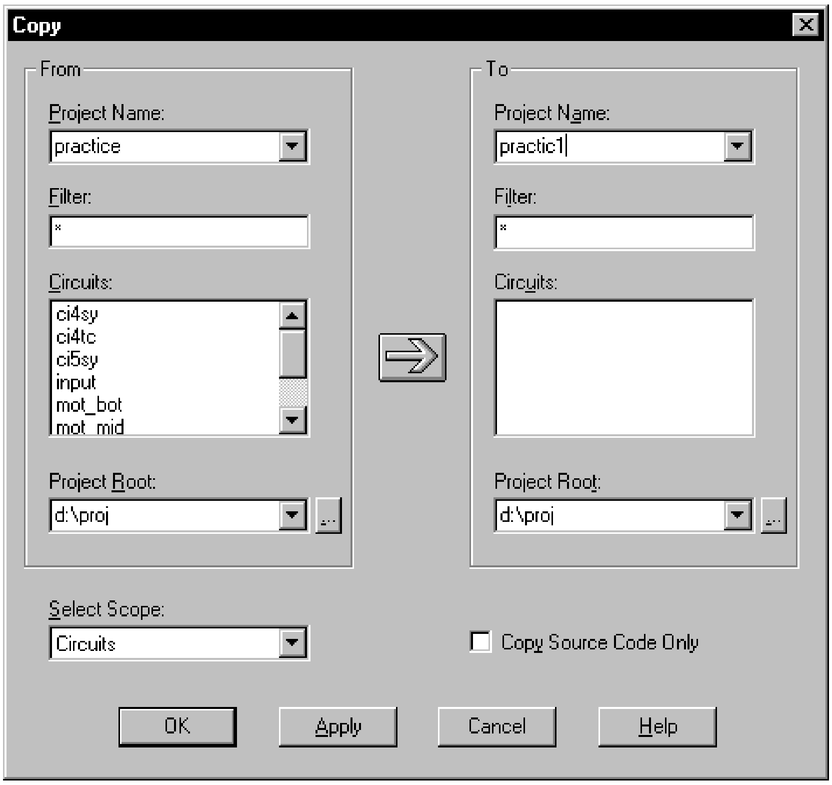
The **From** edit field shows the selected node, type circuit or circuit to be copied.

Enter the destination name in the **To** edit field. The two names can be the same if you copy a node, type circuit, or circuit into another project.

Click the **OK** button to start the copy procedure.

3.6.3.16 File | Copy - for Circuits

Use this command to copy application data from a circuit environment.



From

Project Name: practice

Filter: *

Circuits:
ci4sy
ci4tc
ci5sy
input
mot_bot
mot_mid

Project Root: d:\proj

To

Project Name: practic1

Filter: *

Project Root: d:\proj

Select Scope: Circuits

☐ Copy Source Code Only

Figure 3-26. Copy Circuits Dialog

When you start the copy procedure and you have selected one circuit only, the **Copy - Set Destination Name** dialog will be displayed and you can change the destination name (see Section 3.6.3.15, Copy - Set Destination Name Dialog).

When you click the **OK** button, the copy procedure starts.

NOTE

All files of the source circuit are copied to the destination circuit. A circuit can also be copied if the destination project does not exist. The new project will be created if you confirm it.

Dialog Controls

Select Scope

Select "Circuits" from the **Select Scope** list box to copy circuits.

Project Name (From)

Select a project name from the list box to be the source project. You can alternatively enter the name of a project.

Filter

You can insert a filter for the circuits you want to be displayed. The filter can be any letter, number, underscore or a wild card ("*": a number of characters; "?": one character).

Circuits

Select one ore more circuits from the list box you want to copy. If you have selected more than one circuit the destination circuit names will be the same as the source circuit names. If you decided to copy one circuit only, the **Copy - Set Destination Name** dialog box appears, where you can edit the destination circuit name. See Section 3.6.3.15, Copy - Set Destination Name Dialog.

Project Root (From)

Select a project root from the list box to be the source root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:
‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.
Other characters may be invalid depending on the file system.

Project Name (To)

Select a project name from the list box to be the destination project. You can alternatively enter the name of a project.

Project Root (To)

Select a project root from the list box to be the destination root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Copy Source Code Only

Check the check box **Copy Source Code Only** if you want to copy only the source code file(s) of the selected circuit(s). The following files are concerned:

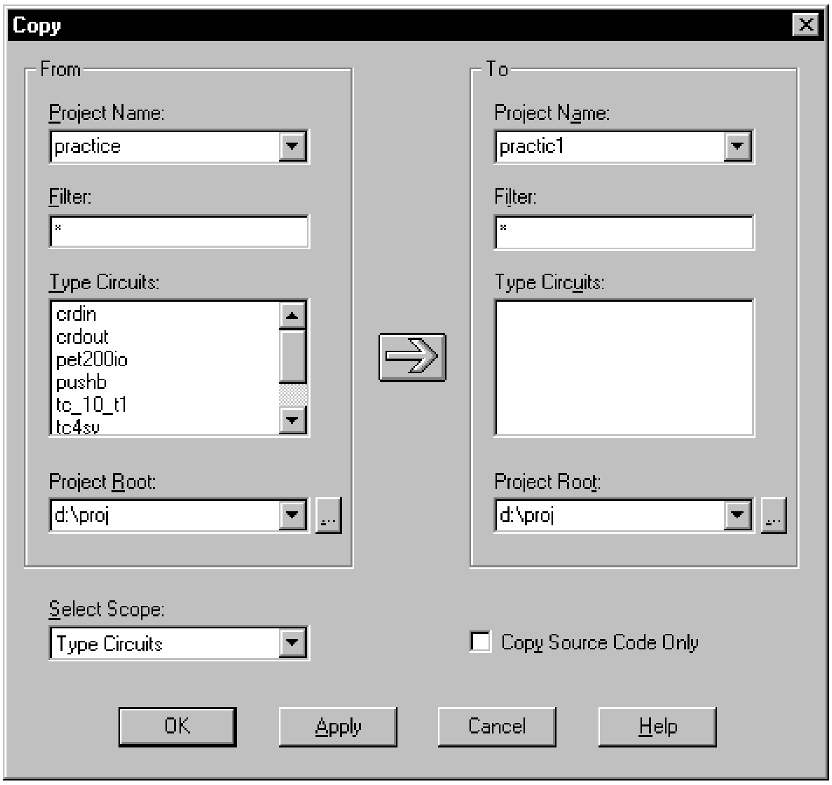
Circuit specific files: *.CIS

Buttons

Click the **Apply** button or the **arrow** button in the middle of the **Copy** dialog to start to copy. The dialog remains open and you can perform another operation. Click on the **OK** button if you want to close the dialog directly after copying. When using the **Apply** button or the **arrow** button, then the **Cancel** button changes to **Close** button.

3.6.3.17 File | Copy - for Type Circuits

Use this command to copy application data from a type circuit environment.



From
Project Name: practice
Filter: *
Type Circuits:
crdin
crdout
pet200io
pushb
tc_10_t1
tc4sv
Project Root: d:\proj

To
Project Name: practic1
Filter: *
Type Circuits:
Project Root: d:\proj

Select Scope: Type Circuits
☐ Copy Source Code Only

Figure 3-27. Copy Type Circuits Dialog

When you start the copy procedure and you have selected one type circuit only, the **Copy - Set Destination Name** dialog will be displayed and you can change the destination name (see Section 3.6.3.15, Copy - Set Destination Name Dialog).

When you click the **OK** button, the copy procedure starts.

NOTE

All files of the source type circuit are copied to the destination type circuit.
A type circuit can also be copied if the destination project does not exist.
The new project will be created if you confirm it.

Dialog Controls

Select Scope

Select "Type Circuits" from the **Select Scope** list box to copy type circuits.

Project Name (From)

Select a project name from the list box to be the source project. You can alternatively enter the name of a project.

Filter

You can insert a filter for the type circuits you want to be displayed. The filter can be any letter, number, underscore or a wild card ("*": a number of characters; "?": one character).

Type Circuits

Select one ore more type circuits from the list box you want to copy. If you have selected more than one type circuit the destination type circuit names will be the same as the type source circuit names. If you decided to copy one type circuit only, the **Copy - Set Destination Name** dialog box appears, where you can edit the destination type circuit name. See Section 3.6.3.15, Copy - Set Destination Name Dialog.

Project Root (From)

Select a project root from the list box to be the source root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:
‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.
Other characters may be invalid depending on the file system.

Project Name (To)

Select a project name from the list box to be the destination project. You can alternatively enter the name of a project.

Project Root (To)

Select a project root from the list box to be the destination root. You can alternatively enter the name of a project root. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Copy Source Code Only

Check the check box **Copy Source Code Only** if you want to copy only the source code file(s) of the selected type circuit(s). The following files are concerned:

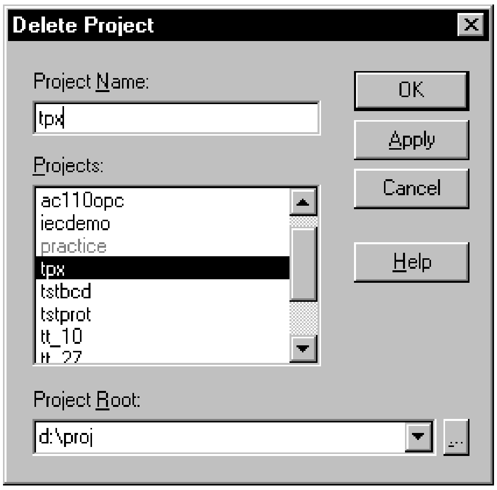
Type circuit files: *.TCS

Buttons

Click the **Apply** button or the **arrow** button in the middle of the **Copy** dialog to start to copy. The dialog remains open and you can perform another operation. Click on the **OK** button if you want to close the dialog directly after copying. When using the **Apply** button or the **arrow** button, then the **Cancel** button changes to **Close** button.

3.6.3.18 File | Delete | Project

Use this command (always available) to delete a whole project.



Project Name: tpx

Projects:
ac110opc
iecdemo
practice
tpx
tstbcd
tstprot
tt_10
tt_27

Project Root: d:\proj

Figure 3-28. Delete Project Dialog

The projects list box displays all projects including the current open project. Select one of the projects and click the **OK** button or the **Apply** button.

NOTE

The current open project cannot be deleted.

When using the **Apply** button the dialog remains open and you have the opportunity to delete another project. When using the **Apply** button, then the **Cancel** button changes to **Close** button (you cannot undo any deletion).

The filter function is useful to display a subset of the available projects, for example if many projects are available. The wild cards "?" (one character) and "*" (group of characters) are supported.

Before deletion you must confirm a warning message.

You cannot delete locked projects. For more information see Section 3.5.8, Locking.

Dialog Controls

Project Name

Displays the selected project name. You can also enter one of the project names of the list in this edit field. The filter function is useful to display a subset of the available projects, for example if many projects are available. The wild cards "?" (one character) and "*" (group of characters) are supported.

Projects

All existing projects are displayed here. If you have used a wild card ("*", "?"), then the remaining projects are displayed. You can click on a project, then the name appears in the project name edit field.

Project Root

Displays the current project root. You can choose another project root in the list. You can click on the **Browse** button **[...]** to open the **Select Project Root** dialog box and navigate in your computer and computer network.

Since APB version 2.7 the project root can be up to 160 characters long.
You can use also the UNC paths form: `\\`*`servername`*`\`*`sharename`*.

Invalid characters in project root:
‘ ’ (space), ‘@’, ‘,’, ‘!’, ‘<’, ‘>’, ‘|’.
Other characters may be invalid depending on the file system.

Apply

When using the **Apply** button the dialog remains open and you have the opportunity to delete another project. When using the **Apply** button, then the **Cancel** button changes to **Close** button (you cannot undo any deletion).

3.6.3.19 File | Delete | Selected

Use the **File | Delete | Selected** command to delete one or more nodes, circuits, or type circuits. **File | Delete | Selected** is available if one or more objects are selected in the **Node List**, **Circuit List**, or **Type Circuit List**.

Before deletion you must confirm a warning message. You can also cancel the operation.
You cannot delete locked objects. For more information see Section 3.5.8, Locking.

Shortcut

Keys: DEL

3.6.3.20 File | Lock/Unlock

Use the **File | Lock/Unlock** command to lock/unlock one or more nodes, circuits, or type circuits. **File | Lock/Unlock** is available if one or more objects are selected in the **Node List**, **Circuit List**, or **Type Circuit List**.

For locking see also Section 3.6.3.10, File | Open | Node List for locking of nodes,
Section 3.6.3.12, File | Open | Type Circuit List for locking of type circuits,
or Section 3.6.3.11, File | Open | Circuit List for locking of circuits.

Before unlocking you must confirm a warning message.

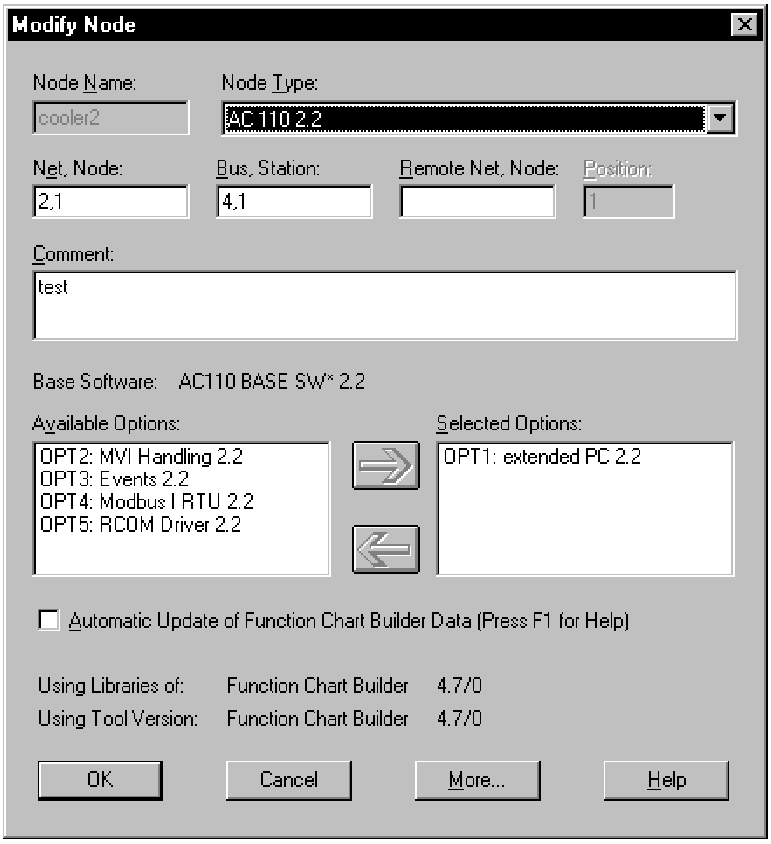
For more information see Section 3.5.8, Locking.

Shortcut

Keys: ALT+L

3.6.3.21 File | Modify - for Node

Use this command to modify a node.



Node Name: cooler2

Node Type: AC 110 2.2

Net, Node: 2,1

Bus, Station: 4,1

Remote Net, Node:

Position: 1

Comment: test

Base Software: AC110 BASE SW* 2.2

Available Options:
OPT2: MVI Handling 2.2
OPT3: Events 2.2
OPT4: Modbus I RTU 2.2
OPT5: RCOM Driver 2.2

Selected Options:
OPT1: extended PC 2.2

☐ Automatic Update of Function Chart Builder Data (Press F1 for Help)

Using Libraries of:	Function Chart Builder	4.7/0
Using Tool Version:	Function Chart Builder	4.7/0

Figure 3-29. Modify Node Dialog

In this dialog you can modify:

- Node type (this includes also a possible change of the base software and the available options)
- Address
- Comment
- Selected options.

Further on you can change tool versions via the **More** button.

The **File | Modify** command is available if a single node is selected.

Shortcut

Keys: CTRL+M

Dialog Controls

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name.

If you have defined a default node type with the **Option | Project Defaults** command, then this node type is selected per default and the defined tool versions will be assigned for the new node, circuit, or type circuit.

NOTE

> When you change the default node type or if no default versions are defined, then always the latest tool versions are used.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Net, Node

For some node types a net and node identification is necessary. Enter a valid and unique net and node number.

Bus, Station

For some node types a bus and station identification is necessary in addition. Enter a valid and unique bus and station number. This edit field is dimmed, if this identification is not necessary for the selected node type.

Remote Net, Remote Node

For some node types a remote net and remote node identification is necessary in addition, for example an RCOM address. Enter a valid remote net and remote node number. This edit field is dimmed, if this identification is not necessary for the selected node type.

RNet is the remote network number of an RCOM network or a dial-up line using the RCOM protocol. RNode is the node in the RCOM network or a dial-up line.

Position

For some node types a position identification is necessary. This edit field is dimmed and empty, if this identification is not necessary for the selected node type. It is dimmed and contains a predefined position number for certain node types. In such cases you cannot change the position as the predefined position is the only valid one.

If the edit field is not dimmed, enter a valid position number.

Comment

You can enter a comment with up to 132 characters.

Base Software

The base software is the necessary software of the selected node type. In addition to the base software you can select options, which extend the functionality performed by the base software of that node type.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options. You can add or remove options. Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. You may get a message that Function Chart Builder must re-initialize the object when changing options.

Automatic Update of Function Chart Builder Data

If you change the tool version for an object, you have to update its internal data representation (*.ODB file).

Select this check box to update the internal data representation (*.ODB file) of the object automatically, in the same way as by the **File | Update FCB Data | Selected** command.

Unselect this check box if you want to update the internal data representation manually, by generating source code from the old *.ODB with the old Function Chart Builder version and backtranslating the source code with the new Function Chart Builder version to a new *.ODB.

NOTE

> The automatic update covers Function Chart Builder versions 4.6/*, 4.7/*, and higher. That means, you can use the **File | Modify** command for upgrading *.ODB files from 4.6/0 to 4.7/0, also for "downgrading" from FCB 4.7 to 4.6/1, but not for upgrading from 4.5/0 to 4.6/1.

Using Libraries of

Here, you can identify which libraries are currently used. You may use either libraries of the node itself, or libraries of Function Chart Builder. For more information about the library handling see Section 3.6.3.5, Function Chart Builder Libraries Dialog.

Using Tool Version

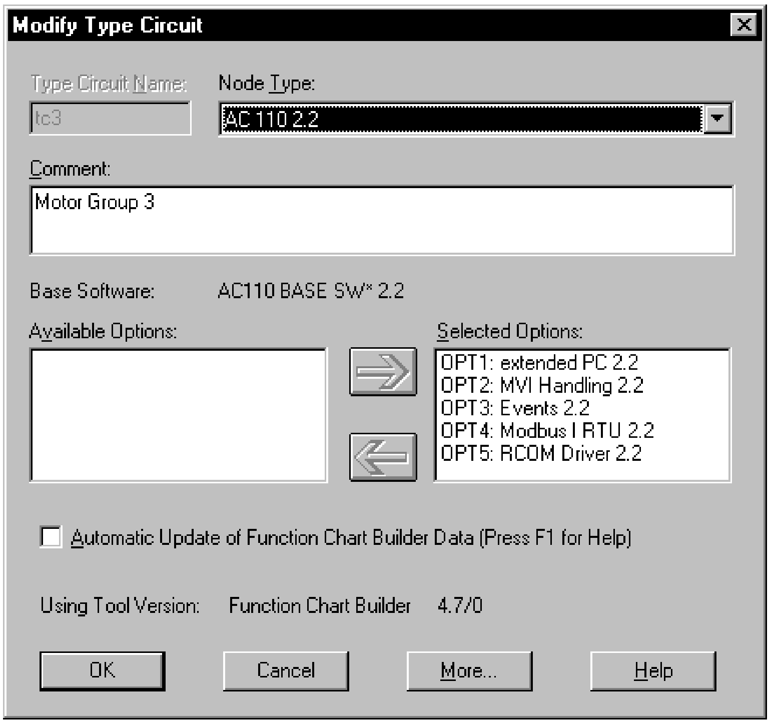
Here, the current Function Chart Builder version that is assigned to the node, is displayed.

More

When you click the **More…** button, then the **More Settings** dialog pops up. Here you can change tool version (see Section 3.6.3.4, Select Tool Versions Dialog) or export, import or delete Function Chart Builder libraries. See Section 3.6.3.5, Function Chart Builder Libraries Dialog for more information.

3.6.3.22 File | Modify - for Circuit/Type Circuit

Use this command to modify a circuit/type circuit (a circuit or type circuit must be selected).



Type Circuit Name: tc3

Node Type: AC 110 2.2

Comment: Motor Group 3

Base Software: AC110 BASE SW* 2.2

Selected Options:

OPT1: extended PC 2.2
OPT2: MVI Handling 2.2
OPT3: Events 2.2
OPT4: Modbus I RTU 2.2
OPT5: RCOM Driver 2.2

☐ Automatic Update of Function Chart Builder Data (Press F1 for Help)

Using Tool Version: Function Chart Builder 4.7/0

Figure 3-30. Modify Circuit/Type Circuit Dialog

The dialog for modifying a circuit is in general the same as the dialog for modifying a type circuit and pops up if you have selected a circuit.

In this dialog you can modify:

- Node type (this includes also a possible change of the base software and the available options)
- Comment
- Selected options.

Further on you can change tool versions via the **More** button.

The **File | Modify** command is available if a single circuit/type circuit is selected.

Shortcut

Keys: CTRL+M

Dialog Controls

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name.

If you have defined a default node type with the **Option | Project Defaults** command, then this node type is selected per default and the defined tool versions will be assigned for the new node, circuit, or type circuit.

NOTE

> When you change the default node type or if no default versions are defined, then always the latest tool versions are used.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Comment

You can enter a comment with up to 132 characters.

Base Software

The base software is the necessary software of the selected node type. In addition to the base software you can select options, which extend the functionality performed by the base software of that node type.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options. You can add or remove options. Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. You may get a message that Function Chart Builder must re-initialize the object when changing options.

Automatic Update of Function Chart Builder Data

If you change the tool version for an object, you have to update its internal data representation (*.ODB file).

Select this check box to update the internal data representation (*.ODB file) of the object automatically, in the same way as by the **File | Update FCB Data | Selected** command.

Unselect this check box if you want to update the internal data representation manually, by generating source code from the old *.ODB with the old Function Chart Builder version and backtranslating the source code with the new Function Chart Builder version to a new *.ODB.

NOTE

The automatic update covers Function Chart Builder versions 4.6/*, 4.7/*, and higher. That means, you can use the **File | Modify** command for upgrading *.ODB files from 4.6/0 to 4.7/0, also for "downgrading" from FCB 4.7 to 4.6/1, but not for upgrading from 4.5/0 to 4.6/1.

Using Tool Version

Here, the current Function Chart Builder version that is assigned to the node, is displayed.

More

When you click the **More…** button, then the **More Settings** dialog pops up. Here you can change the tool version (see Section 3.6.3.4, Select Tool Versions Dialog).

3.6.3.23 File | Retrieve Application

Use this command to retrieve the application from the target.

NOTE

Application Retrieval is supported by Function Chart Builder 4.6 and higher.

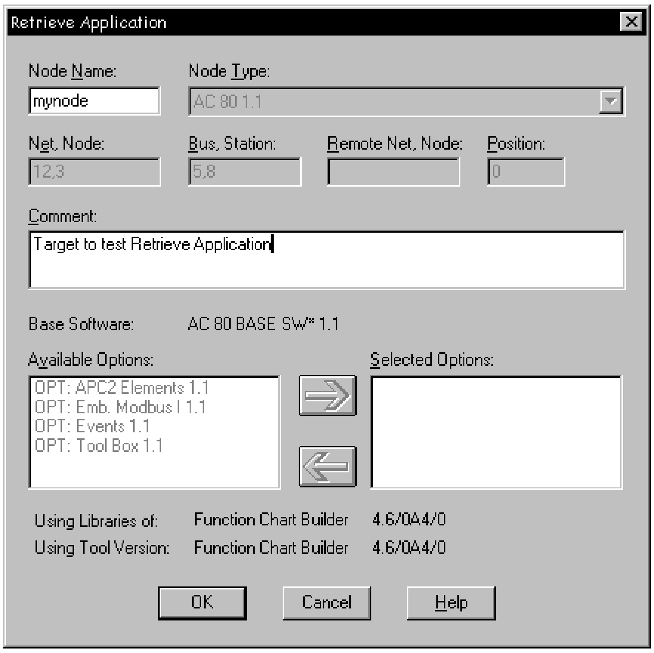
The function is available only for node types explicitly supporting application retrieval, such as AC 80 2.0.

The application can only be retrieved if the Function Chart Builder with which the target code was generated is still installed.

First, the **Connect Target** dialog of Function Chart Builder is displayed. Enter the relevant data to connect to the target.

Then, Function Chart Builder tries to upload the node stored on the target.

If uploading the node succeeded, the following dialog is displayed:



Retrieve Application

Node Name: mynode
Node Type: AC 80 1.1
Net, Node: 12,3
Bus, Station: 5,8
Remote Net, Node:
Position: 0
Comment: Target to test Retrieve Application
Base Software: AC 80 BASE SW* 1.1

Available Options:
- OPT: APC2 Elements 1.1
- OPT: Emb. Modbus I 1.1
- OPT: Events 1.1
- OPT: Tool Box 1.1

Selected Options:

Using Libraries of: Function Chart Builder 4.6/0A4/0
Using Tool Version: Function Chart Builder 4.6/0A4/0

Figure 3-31. Retrieve Application Dialog

In this dialog the node that is stored on the target is displayed. You may only change the node name and comment.

NOTE

> If you change the name, on-line changes are not possible after retrieval of the node. You have to generate new target code and load the application.

If you click **OK**, Application Builder creates the node with the data uploaded from the target. If a node with that name already exists, you are asked to overwrite it. After creation of the node, Application Builder automatically starts Function Chart Builder functions to upload the application and to backtranslate the target code. Now, the ODB, all domains and description files are restored.

The on-line mode in Function Chart Builder is available. That means that test functions and on-line edit is possible. The node is in the same state as after execution of **Generate Target Code** command of Function Chart Builder.

The **File | Retrieve Application** command is available if the **Node List** is open.

Dialog Controls

Node Name

This is the name of the node as retrieved from the target. You may enter a new name for the node in this edit field. The maximum length is eight characters (a..z, A..Z, 0..9, and “_”). If you change the name, on-line changes are not possible for this node, you have to generate target code and load the application.

Node Type, Net, Node, etc.

The node type, version, net and node address, and so on, retrieved from the target are displayed. You cannot change these entries.

Comment

You can enter a comment with up to 132 characters.

Available Options

The available options for the node type are displayed here. You cannot change this entry.

Selected Options

Displays the selected options. You cannot change this entry.

Using Libraries of

Here, you can identify which libraries are currently used. You may use either libraries of the node itself, or libraries of Function Chart Builder. For more information about the library handling see Section 3.5.7, Usage of AMPL PC and DB Element Libraries.

Using Tool Version

This is the current Function Chart Builder version assigned to the node.

3.6.3.24 File | Update FCB Data | Project

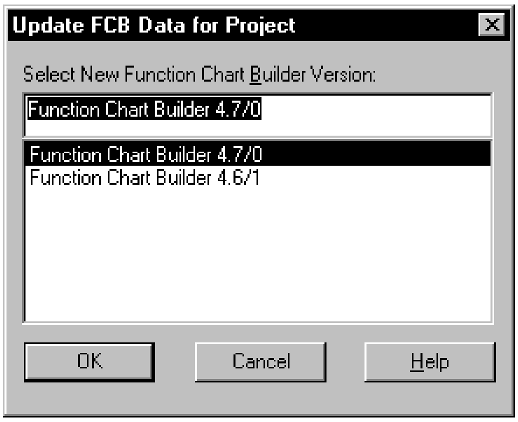
Use this command to shorten the procedure of updating nodes, circuits, and type circuits of a project.

NOTES

Updating the internal data representation (*.ODB files) of objects is mandatory when you install a new version of the Function Chart Builder and you want to work on them with this new version.

The update covers Function Chart Builder versions 4.6/*, 4.7/*, and higher. That means, you can use this command for upgrading *.ODB files from 4.6/0 to 4.7/0, also for “downgrading” from FCB 4.7 to 4.6/1, but not for upgrading from 4.5/0 to 4.6/1.

In case of nodes containing only PC part or only DB part the update works only for Function Chart Builder versions 4.7/* and higher.


Update FCB Data for Project
Select New Function Chart Builder Version:
OK
Cancel
Help

Function Chart Builder 4.7/0

Function Chart Builder 4.7/0
Function Chart Builder 4.6/1

Figure 3-32. Update FCB Data for Project Dialog

The Application Builder executes the following steps for each object of the selected project:

1. Generates source code from the current (old) internal data representation (*.ODB files). This happens by functions of the Function Chart Builder version, with which the *.ODB files were created and edited.
2. Backtranslates the source code to new internal data representation. This happens by functions of the Function Chart Builder version, with which the objects are to be edited.

Activate the **OK** button to start the update.

The Application Builder warns you that the (old) internal data representations of the objects will be initialized and the circuit and type circuit source code files will be regenerated. By the **No** button of the warning dialog box you can cancel the update. Continue by the **Yes** button.

The Application Builder generates a log file (UPDATEFCBDATA*.LOG) with all steps of the update. At the completion of update, a message informs you about success of the procedure. In case of errors the log file will be opened with the text editor.

Dialog Controls

Select New Function Chart Version

The list box contains all of the Function Chart Builder versions that are installed on your engineering station.

Select the version, with which you intend to edit the selected project or some of its objects.

The text box contains the selection.

3.6.3.25 File | Update FCB Data | Selected

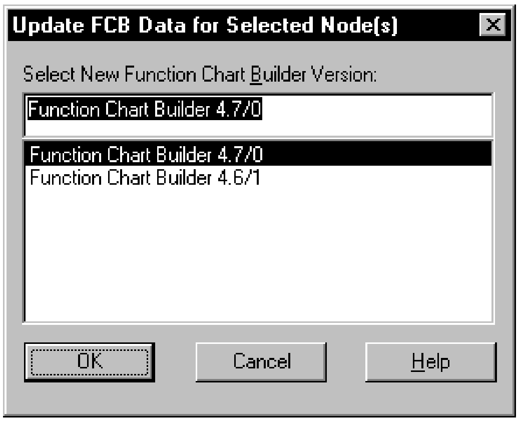
Use this command to shorten the procedure of updating the selected—one or several—nodes, circuits, or type circuits of a project.

NOTES

Updating the internal data representation (*.ODB files) of objects is mandatory when you install a new version of the Function Chart Builder and you want to work on them with this new version.

The update covers Function Chart Builder versions 4.6/*, 4.7/*, and higher.
That means, you can use this command for upgrading *.ODB files from 4.6/0 to 4.7/0, also for "downgrading" from FCB 4.7 to 4.6/1, but not for upgrading from 4.5/0 to 4.6/1.

In case of nodes containing only PC part or only DB part the update works only for Function Chart Builder versions 4.7/* and higher.



Update FCB Data for Selected Node(s)

Select New Function Chart Builder Version:

Function Chart Builder 4.7/0

Function Chart Builder 4.7/0
Function Chart Builder 4.6/1

Figure 3-33. Update FCB Data for Nodes Dialog

The dialogs for updating the internal data representation of circuits and type circuits are similar.

The Application Builder executes the following steps for each selected object:

1. Generates source code from the current (old) internal data representation (*.ODB files). This happens by functions of the Function Chart Builder version, with which the *.ODB files were created and edited.
2. Backtranslates the source code to new internal data representation. This happens by functions of the Function Chart Builder version, with which the objects are to be edited.

Activate the **OK** button to start the update.

The Application Builder warns you that the (old) internal data representations of the objects will be initialized.
In case of AC 100 Series nodes, it warns that you will have to generate and download target code anew before going on-line.
In case of circuits and type circuits, it warns that their source code files will be regenerated.

By the **No** button of the warning dialog box you can cancel the update. Continue by the **Yes** button.

The Application Builder generates a log file (UPDATEFCBDATA*.LOG) with all steps of the update. At the completion of update, a message informs you about success of the procedure. In case of errors the log file will be opened with the text editor.

Dialog Controls

Select New Function Chart Version

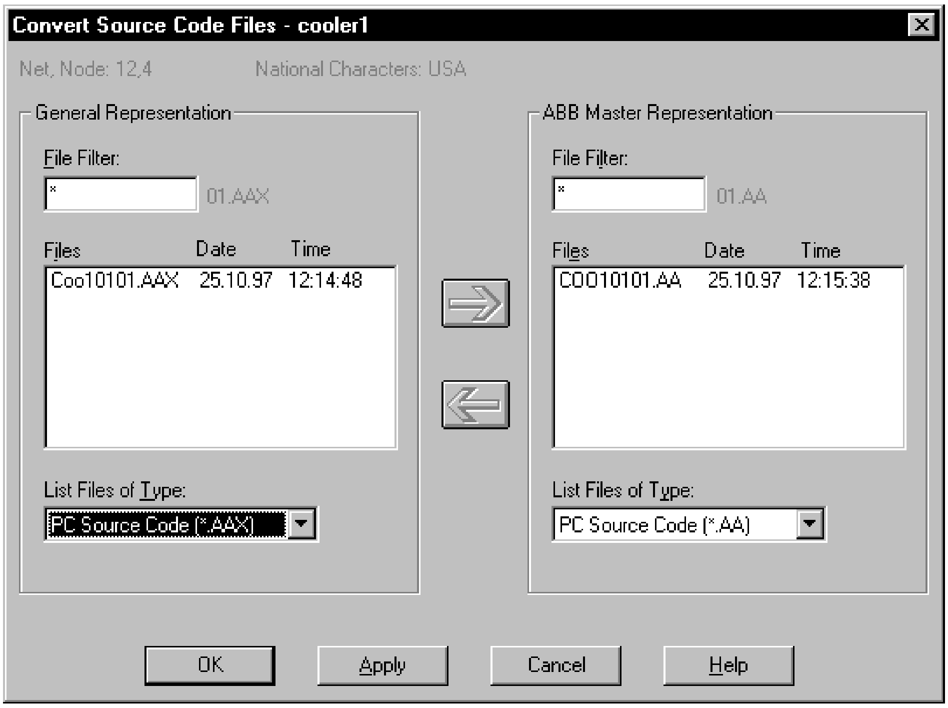
The list box contains all of the Function Chart Builder versions that are installed on your engineering station.

Select the version, with which you intend to edit the selected project or some of its objects.

The text box contains the selection.

3.6.3.26 File | Convert

Use this command to convert the node’s source code files.


Convert Source Code Files - cooler1

Net, Node: 12,4
National Characters: USA

General Representation
File Filter: * 01.AAX
Files | Date | Time
Coo10101.AAX 25.10.97 12:14:48
List Files of Type: PC Source Code (*.AAX)

ABB Master Representation
File Filter: * 01.AA
Files | Date | Time
COO10101.AA 25.10.97 12:15:38
List Files of Type: PC Source Code (*.AA)

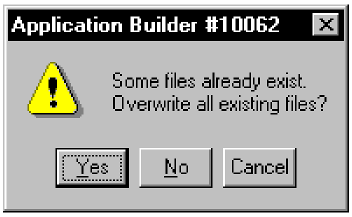
Figure 3-34. Convert Source Code Files Dialog

The **File | Convert** command is available if a single node is selected.

You can convert source code for On-line Builder if you select files on the left hand side of the **Convert** dialog and start the conversion or you can do the reverse conversion procedure.

Then you select files on the right hand side of the **Convert** dialog and start the conversion.

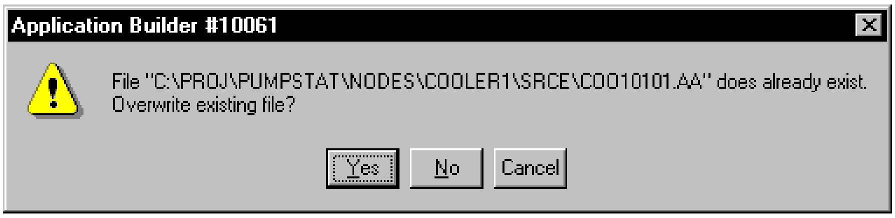
If you want to convert more than one file and output files already exists, the following warning dialog box will be displayed:



Some files already exist.
Overwrite all existing files?

Figure 3-35. Replace All Warning Dialog

Click the **Yes** button to replace all files. When you click the **No** button, then a warning message will be displayed for each file that already exists:



File "C:\PROJ\PUMPSTAT\NODES\COOLER1\SRCE\C0010101.AA" does already exist.
Overwrite existing file?

Figure 3-36. Replace One Warning Dialog

Click the **Yes** button to replace this file. If you click the **No** button, then you can decide if you want to replace the next file as well. The **Cancel** button cancels the whole convert procedure.

Dialog Controls

Net, Node

Displays the net and node number.

National Characters

Displays the project-specific national characters.

File Filter (general representation)

You can insert a filter for the files in general representation you want to be displayed. The filter can be any letter, number or a wild card (“*”: a number of characters; “?”: one character). Only file names matching that filter are displayed.

Files (general representation)

Displays the existing files of a file type. You define the file type in the **List Files of Type** list box. If you have checked **Select all Source Code Files** then all existing source code files will be displayed.

If a PC program consists of more than one file, only the first one will be displayed, the other files will be converted automatically.

List Files of Type (general representation)

Select a type of files you want to convert in the list. The existing files of that type will then be displayed in the **Files** list box. You can display the following file types:

- PC source code (*.AAX)
- DB source code (*.BAX)
- Type circuit DB part (*.TBX)
- Type circuit information file (*.TIX)
- Type circuit source code (*.TCS)
- Command Files (*.CFX).

Select the item **All Source Code Files** if you want to convert all source code files. Then all files in the DBDATA, PCDATA, TCDATA directories and the command files in the LIST directory are displayed in the list box and they are all selected automatically. You can de-select single files in the list box.

Arrow Buttons

When using the **arrow** buttons the dialog remains open and you have the opportunity to convert other files. When using the **arrow** buttons, then the **Cancel** button changes to **Close** button (you cannot undo any conversion). During conversion an hourglass pointer is displayed. After conversion the content of the list boxes are updated (new file names, new date and time).

File Filter (ABB Master representation)

You can insert a filter for the files in ABB Master representation you want to be displayed. The filter can be any letter, number, underscore or a wild card ("*": a number of characters; "?": one character). Only file names matching that filter are displayed.

Files (ABB Master representation)

Displays the existing files of a file type. You define the file type in the **List Files of Type** list box. If you have checked **Select all Source Code Files** then all existing source code files will be displayed.

If a PC program consists of more than one file, only the first one will be displayed, the other files will be converted automatically.

List Files of Type (ABB Master representation)

Select a type of files you want to convert in the list. The existing files of that type will then be displayed in the **Files** list box. You can display the following file types:

- PC source code (*.AA)
- DB source code (*.BA)
- Type circuit DB part (*.TB)
- Type circuit information file (*.TI)
- Type circuit source code (*.TC)
- Command Files (*.CF).

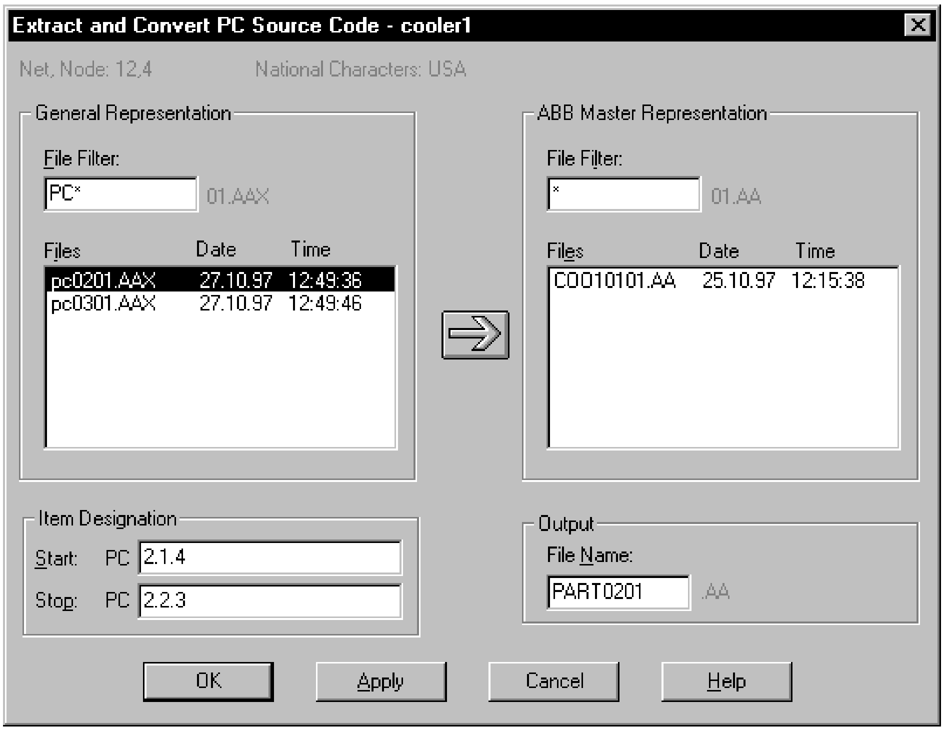
Select the item **All Source Code Files**, if you want to convert all source code files. Then all files in the directories SRCE and USER are displayed in the list box and they are all selected automatically. You can de-select single files in the list box.

Apply Button

When using the **Apply** button the dialog remains open and you have the opportunity to convert other files. When using the **Apply** button, then the **Cancel** button changes to **Close** button (you cannot undo any conversion). During conversion an hourglass pointer is displayed.
After conversion the content of the list boxes are updated (new file names, new date and time).

3.6.3.27 File | Extract

Use the **File | Extract** command to extract PC source code files.



Extract and Convert PC Source Code - cooler1

Net, Node: 12,4
National Characters: USA

General Representation
File Filter: PC* 01.AAX

Files	Date	Time
pc0201.AAX	27.10.97	12:49:36
pc0301.AAX	27.10.97	12:49:46

ABB Master Representation
File Filter: * 01.AA

Files	Date	Time
CO010101.AA	25.10.97	12:15:38

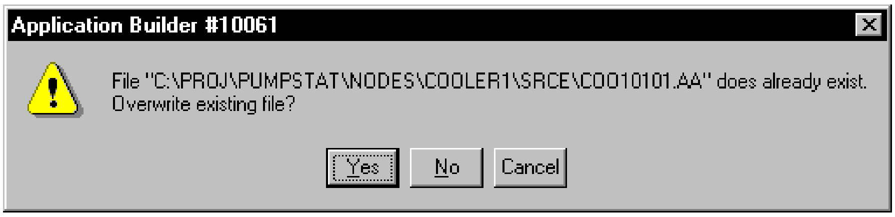
Item Designation
Start: PC 2.1.4
Stop: PC 2.2.3

Output
File Name: PART0201 .AA

Figure 3-37. Extract and Convert PC Source Code Dialog

The **File | Extract** command is available if a single node is selected. When you start the extract function, then the output file will contain the specified section of the source code file and will be converted in addition into ABB Master representation (7-bit source code). The source code is transferred from "\PCDATA (*.AAX)" to the SRCE directory of the same node and changes the file extension to "*.AA" of the given output file name.

If you want to extract a file and the output file already exists a warning dialog box will be displayed:



File "C:\PROJ\PUMPSTAT\NODES\COOLER1\SRCE\COO10101.AA" does already exist.
Overwrite existing file?

Figure 3-38. Replace One Warning Dialog

Dialog Controls

Net, Node

Displays the net and node number.

National Characters

Displays the project-specific national characters.

File Filter (general representation)

You can insert a filter for the files in general representation you want to be displayed. The filter can be any letter, number or a wild card ("*": a number of characters; "?": one character). Only file names matching that filter are displayed.

Files (general representation)

Displays the existing PC source code files in the PCDATA directory of the selected node (general representation). If a PC program consists of more than one file, only the first one will be displayed, the other files will be used for extracting automatically.

Start Item Designation

Specify a start PC item designation to define, which part of the PC program you want to extract.

Stop Item Designation

Specify a stop PC item designation to define, which part of the PC program you want to extract. Enter the item designation without a leading "PC". The stop item designation may contain an asterisk (*) as wild card. An asterisk is allowed only once in the item designation and only after the period character. No other character must follow. The wild card is useful if you do not exactly know the number of PC elements below a PC element.

Arrow Button

When using the **arrow** button the dialog remains open and you have the opportunity to extract other files. When using the **arrow** button, then the **Cancel** button changes to **Close** button (you cannot undo any extract procedure). During extraction an hourglass pointer is displayed. After extraction the content of the list boxes are updated (new file names, new date and time).

File Filter (ABB Master representation)

You can insert a filter for the files in ABB Master representation you want to be displayed. The filter can be any letter, number, underscore or a wild card ("*": a number of characters; "?": one character). Only file names matching that filter are displayed.

Files (ABB Master representation)

Displays the existing PC source code files in the SRCE directory of the selected node (ABB Master representation).

Output File Name

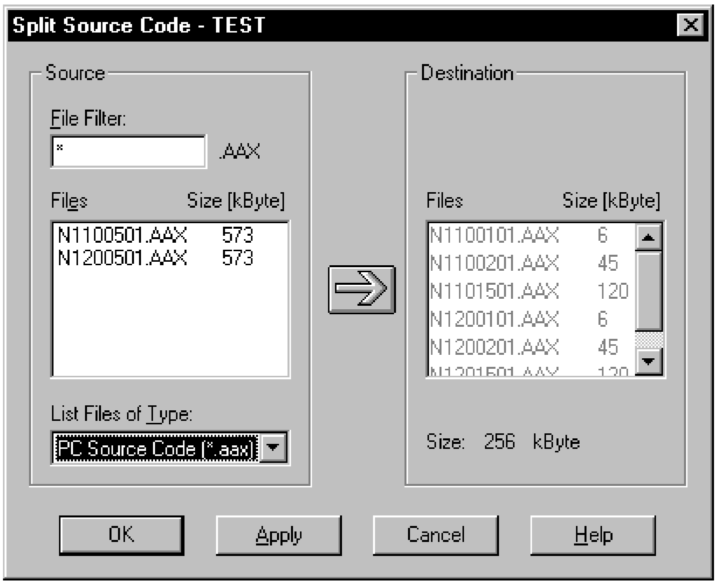
Define a name for the output file (must not be identical with the input file name), or use the default name.

Apply Button

When using the **Apply** button the dialog remains open and you have the opportunity to convert other files. When using the **Apply** button, then the **Cancel** button changes to **Close** button (you cannot undo any conversion). During conversion an hourglass pointer is displayed. After conversion the content of the list boxes are updated (new file names, new date and time).

3.6.3.28 File | Split Source Code

Use this command to split DB or PC source code:



File Filter: * .AAX

Files	Size [kByte]
N1100501.AAX	573
N1200501.AAX	573

List Files of Type: PC Source Code (*.aax)

Files	Size [kByte]
N1100101.AAX	6
N1100201.AAX	45
N1101501.AAX	120
N1200101.AAX	6
N1200201.AAX	45

Size: 256 kByte

Figure 3-39. Split Source Code Dialog

The **File | Split Source Code** command is available if a single node is selected.

Dialog Controls

File Filter

You can insert a filter for the files in general representation you want to be displayed. The filter can be any letter, number or a wild card ("*": a number of characters; "?": one character). Only file names matching that filter are displayed.

Files (source)

Displays the existing files of a file type. You define the file type in the **List Files of Type** list box. You can select only one file at a time. After splitting the parts of the original file will be displayed in the list box on the right hand side.

List Files of Type

Select a type of files you want to split in the list. The existing files of that type will then be displayed in the **Files** list box.

You can display the following file types:

- PC source code (*.AAX)
- DB source code (*.BAX).

Arrow Button

When using the **arrow** button the dialog remains open and you have the opportunity to split other files. When using the **arrow** button, then the **Cancel** button changes to **Close** button (you cannot undo any splitting). During conversion an hourglass pointer is displayed.
After splitting the content of the list boxes are updated.

Files (destination)

Displays all existing files with file size below the defined size in the **Size** list box. Use the **Options | Project Defaults** command to define the file size.

Size

Displays the defined file size. Depending on this value the existing files of that file type will be displayed in the dialog box on the left hand side, they can be split. Those files displayed in the box on the right hand side are already smaller than that value.

Use the **Options | Project Defaults** command to define the file size.

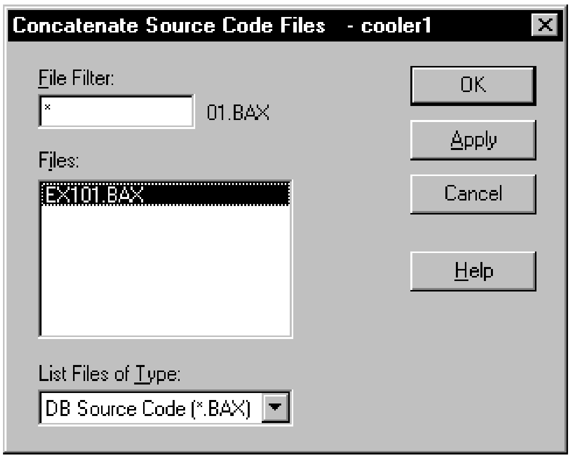
Apply Button

When using the **Apply** button the dialog remains open and you have the opportunity to split other files. When using the **Apply** button, then the **Cancel** button changes to **Close** button (you cannot undo any splitting). During conversion an hourglass pointer is displayed. After splitting the content of the list boxes are updated.

3.6.3.29 File | Concatenate

Use this command to concatenate continuation DB or PC source code files to one single source code file.

The **File | Concatenate** command is available if a single node is selected.



File Filter: * 01.BAX

Files: EX101.BAX

List Files of Type: DB Source Code (*.BAX)

Figure 3-40. Concatenate Dialog

Normally, **File | Convert** generates only one file of "general representation", however you might have existing continuation files which need to be concatenated. The **Files** list box displays only source code files which have continuation files and which match the file filter. Depending on the file type the list boxes are updated.

To concatenate files, select files in the list box. Multiple selection is possible.

When you press the **OK** button the files that are selected will be concatenated, the dialog box is closed. If you press the **Apply** button the dialog box is left open after concatenation. After the concatenation the list box will be updated, that is, the concatenated files are no longer displayed in the list box.

Example:

The list box displays two files, PC10101.AAX and PC50101.AAX. You select PC10101.AAX which has two continuation files PC10102.AAX, and PC10103.AAX. You press **Apply** to concatenate the files. After concatenation, only PC50101.AAX is displayed in the list box. You are now able to start Function Chart Builder and backtranslate the single PC Source Code file.

Dialog Controls

File Filter

You can insert a filter for the files in general representation you want to be displayed. The filter can be any letter, number or a wild card ("*": a number of characters; "?": one character). Only file names matching that filter are displayed.

Files

Displays the existing source code files of a file type when continuation files exist. You define the file type in the **List Files of Type** list box. Multiple selection is possible. After concatenation, the file is no longer displayed in the list box.

List Files of Type

Select a type of files you want to concatenate in the list. The existing files of that type will then be displayed in the **Files** list box.

You can display the following file types:

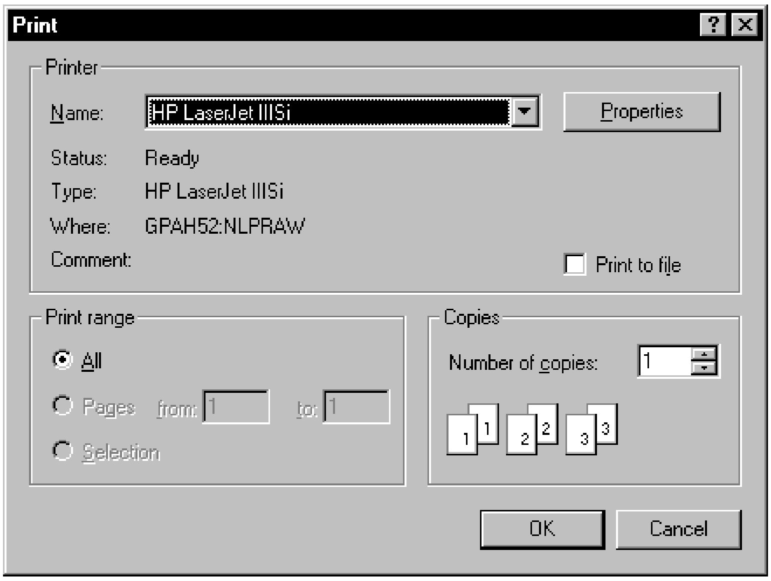
- PC source code (*.AAX)
- DB source code (*.BAX).

Apply Button

When using the **Apply** button the dialog remains open and you have the opportunity to concatenate other files. During conversion an hourglass pointer is displayed. After concatenation the content of the list box is updated.

3.6.3.30 File | Print

Use this command to print a document.



Name: HP LaserJet IIISi
Status: Ready
Type: HP LaserJet IIISi
Where: GPAH52:NLPRAW
Comment:
☐ Print to file

● All
○ Pages from: 1 to: 1
○ Selection

Number of copies: 1

Figure 3-41. Print Dialog

For help for this dialog, click ? in the upper right corner of the dialog window and point to the part of the dialog you want help for. Then the corresponding help text will pop-up.

The **File | Print** command is available if a project is open. You can follow the progress of printing or abort printing in the **Printing Progress** dialog box.

Shortcuts

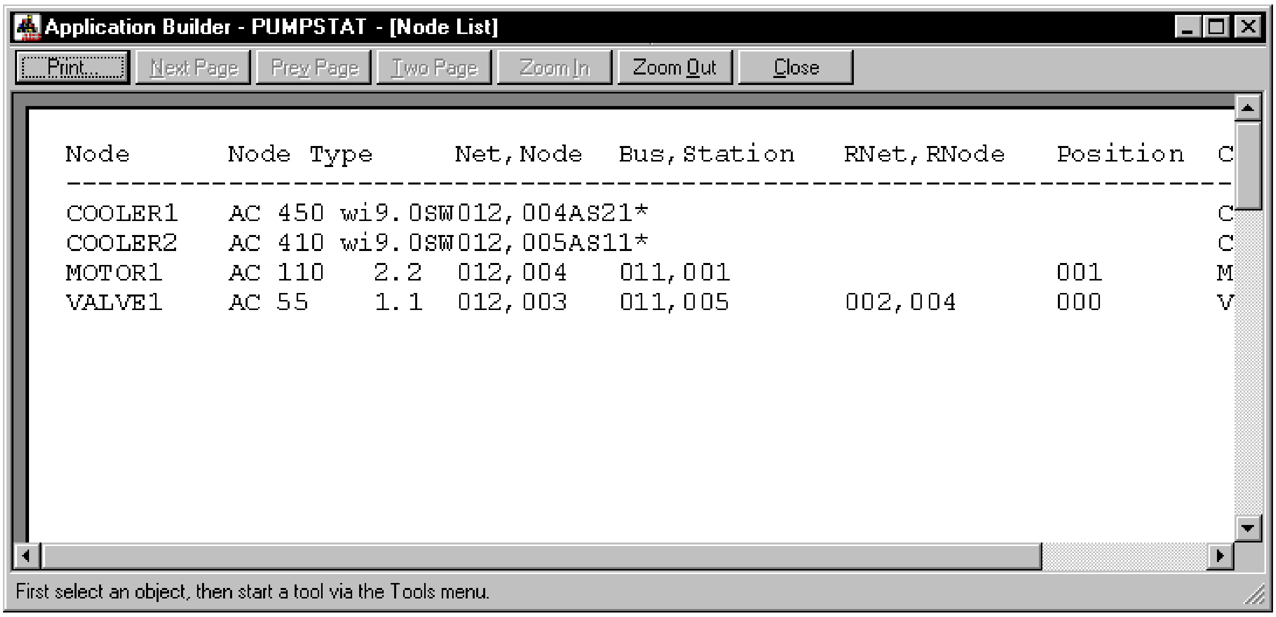
Toolbar: 🖨

Keys: CTRL+P

3.6.3.31 File | Print Preview

Use this command to display the active document as it would appear when printed. When you choose this command, the main window will be replaced with a print preview window in which one or two pages will be displayed in their printed format.

Various buttons are available to zoom in, zoom out, step through the pages, display two pages of the document, close the dialog and to call the **Print** dialog:



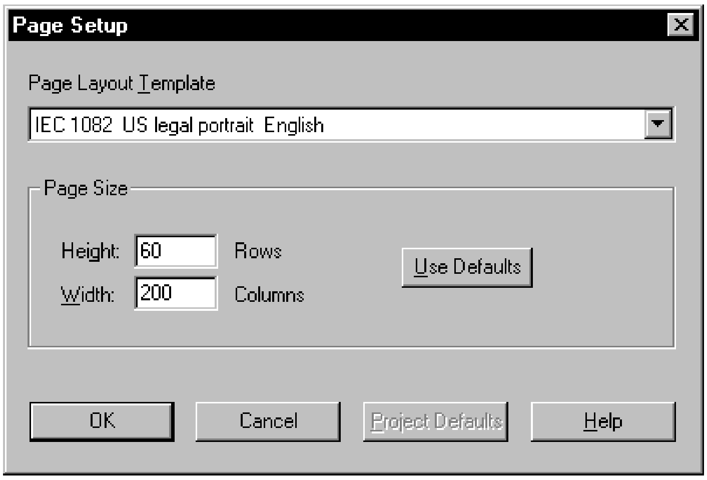
```
Node      Node Type     Net,Node  Bus,Station   RNet,RNode   Position  C
------------------------------------------------------------------------
COOLER1   AC 450 wi9.0SW012,004AS21*                                   C
COOLER2   AC 410 wi9.0SW012,005AS11*                                   C
MOTOR1    AC 110   2.2  012,004   011,001                    001       M
VALVE1    AC 55    1.1  012,003   011,005       002,004      000       V
```

First select an object, then start a tool via the Tools menu.

Figure 3-42. Print Preview Dialog

3.6.3.32 File | Page Setup

Use this command (always available) to choose a layout template and set page size for your diagrams.



Page Layout Template: IEC 1082 US legal portrait English

Height: 60 Rows

Width: 200 Columns

Figure 3-43. Page Setup Dialog

NOTE

If you change only a format or orientation of a page layout template, then the already introduced document texts (Edit Document Texts dialog) will be copied and remain the same.
If you change between the four different kinds (Standard Master, IEC 1082, DIN 6671, and Plain) of page layout templates, then the document texts must be introduced another time (even if they were existent before).

Dialog Controls

Page Layout Template

Select the page layout template for your diagrams from the items of the list box.

Height and Width

Enter the number of rows and columns for a diagram page

Click the **Use Defaults** button to fetch default values corresponding to the page layout template. The number of rows and columns are calculated based on the printable area.

Use Defaults

Click this button in order to fetch default values corresponding to the default page layout template.

Project Defaults

Click this button to fetch the project defaults for layout (layout template and actual page size) as specified with the **Options | Project Defaults** command. The button is inactive, if no project defaults regarding the page setup are specified.

3.6.3.33 File | Project Notes

Use this command to enter project relevant data in a file.

The editor defined in **Options | Preferences** command will be started.

Default name of project notes file is `Prjnotes.txt`.

3.6.3.34 File | Close Project

Use this command to close a project.

The **File | Close Project** command is available if a project is open.

3.6.3.35 File | Exit

Use the **File | Exit** command to end your Application Builder session. You can also use the **Close** command on the application control menu. Application Builder prompts you to save documents with unsaved changes.

Shortcut

Mouse:	Double-click the application's control menu button.
Keys:	ALT+F4

3.6.4 View Menu

3.6.4.1 View | Extend

Use this command to open the **Extended View** dialog of the selected node, circuit, or type circuit. See Section 3.6.2.2, Extended View - for Nodes, Section 3.6.2.4, Extended View - for Circuits, and Section 3.6.2.6, Extended View - for Type Circuits.

The **Extended View** dialog lists and gives access to important files of the selected object.

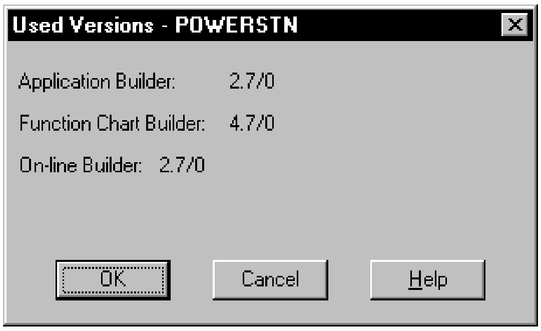
The **View | Extend** command is available if a single node, circuit, or type circuit is selected.

Shortcut

Keys:	ALT+E

3.6.4.2 View | Used Versions

Use this command to display the used tool versions for the selected object.



Used Versions - POWERSTN

Application Builder: 2.7/0

Function Chart Builder: 4.7/0

On-line Builder: 2.7/0

Figure 3-44. Used Versions Dialog

The **View | Used Versions** command is available if a single object is selected.

3.6.4.3 View | Update

Use this command to update the content of the **Node List**, **Circuit List**, or **Type Circuit List**. This is useful especially for server installations.

This command is available if any of the **Node List**, **Circuit List**, and **Type Circuit List** is open.

Shortcut

Keys: F5, ALT+U

3.6.4.4 View | Names Only

Use this command to toggle the displayed content in **Node List**, **Circuit List**, and **Type Circuit List**.

You can toggle the displayed contents between:

- Names only
- Names and all associated data.

All three lists are document windows and may be open at the same time. Only one list (the active document window) will be changed at a time. The **View | Names Only** command is available if any of the **Node List**, **Circuit List**, and **Type Circuit List** is open.

3.6.4.5 View | Toolbar

Use this command (always available) to display and hide the **Toolbar**, which includes buttons for some of the most common commands in Application Builder, such as **File | Open | Node List**. A check mark ✓ appears next to the menu item when the **Toolbar** is displayed.

See Section 3.6.1.2, Controls in Toolbar.

3.6.4.6 View | Status Bar

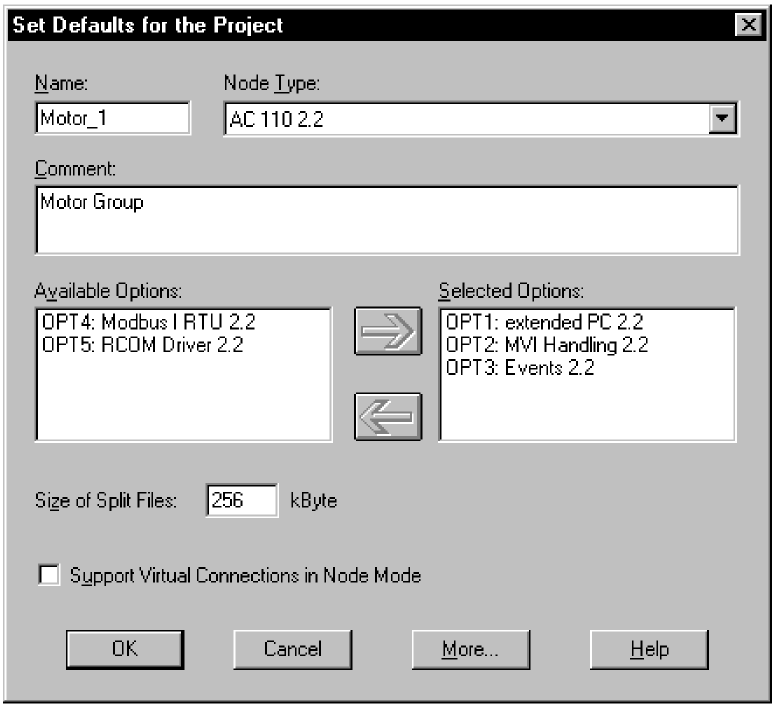
Use this command (always available) to display and hide the **Status Bar**, which describes the action to be executed by the selected menu item or depressed toolbar button, and keyboard latch state. A A check mark ✓ appears next to the menu item when the **Status Bar** is displayed.

See Section 3.6.1.3, Indicators in Status Bar.

3.6.5 Options Menu

3.6.5.1 Options | Project Defaults

Use this command to set defaults for the project.



Name: Motor_1

Node Type: AC 110 2.2

Comment: Motor Group

Available Options:
OPT4: Modbus I RTU 2.2
OPT5: RCOM Driver 2.2

Selected Options:
OPT1: extended PC 2.2
OPT2: MVI Handling 2.2
OPT3: Events 2.2

Size of Split Files: 256 kByte

☐ Support Virtual Connections in Node Mode

Figure 3-45. Set Defaults for the Project Dialog

The **Options | Project Defaults** command is available if a project is open.

All items in this dialog represent default values, which are presented in the corresponding dialogs when you create new nodes, circuits, and type circuits.

You can define the project defaults:

- **One** name for nodes/circuits/type circuits
- **One** node type (this includes also a possible change of the base software and the available options)
- **One** comment
- Selected options for **one** node type.

Further on you can define tool versions, document texts, and page setup when you click the **More** button.

NOTE

> Even the dialogs behind the **More** button (Section 3.6.3.3, More Settings Dialog, then Section 3.6.3.4, Select Tool Versions Dialog, Section 3.6.3.5, Function Chart Builder Libraries Dialog, and Section 3.6.3.6, Edit Document Texts) represent project defaults.

The project defaults will be presented whenever you create a new node, circuit, or type circuit.

The same dialog is available, when you create a new project (**File | New | Project**) and you click on the **Defaults** button.

Dialog Controls

Name

You can enter a default name for a node, circuit, or type circuit.

Node Type

Select a node type in the list, which stand for controllers, operator stations, an engineering station or process stations. Each node type has a specific version, which is named behind the node type name. The selected node type will then be the default when you create new nodes, circuits and type circuits. You can define tool versions for one node type in addition using the **Select Tool Versions** dialog.

The process of creating a new object implies an automatic assignment of tool versions (see Section 3.5.5, Working with Different Versions of Tools). You can influence this automatic process also manually with the **More** button or the **File | Modify** command.

Depending on the chosen node type, you get a different base software and node type specific options displayed in the corresponding list boxes.

Comment

You can enter a default comment.

Available Options

The available options depend on the selected node type and represent additional functions of the selected node type. One example of additional functions are additional PC elements in a process station.

Dependencies between the options of a node type may cause an automatic selection of other options (if you select one option and move the option to the **Selected Options** list box then another/other option(s) may be moved as well). This function supports you to configure your node type correctly.

Select the options you want to use and click the corresponding **arrow** button. The selections move then into the **Selected Options** list box. You can also double-click the list box entry directly.

Arrow Buttons

Make your selections in the list box and click the corresponding **arrow** button. The selections move then into the other list box. You can also double-click the list box entry directly. The entries in the selected options list box will be accepted when you click the **OK** button.

Selected Options

Displays the selected options, which will be the default options.

Size of Split Files

Defines the source code file size. You can split larger files with the **Files | Split Source Code** command.

Support Virtual Connections in Node Mode

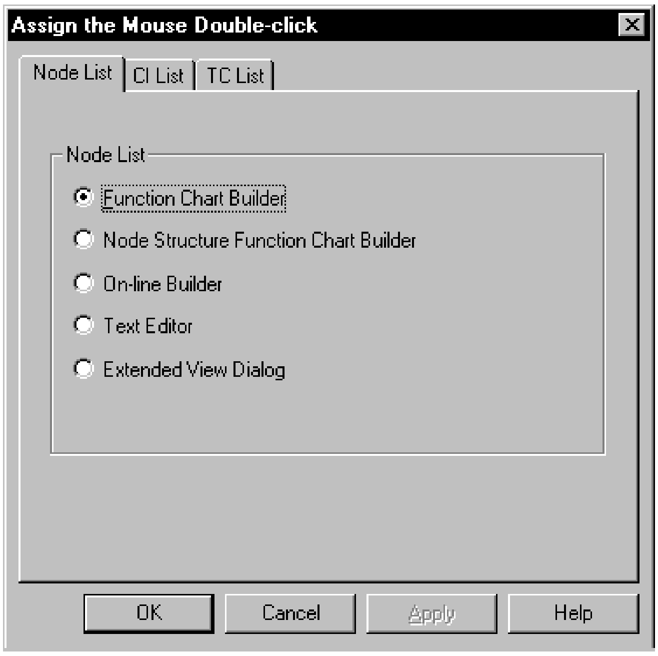
If you check this field, Function Chart Builder will start always with the option enabled. You can specify this option also within Function Chart Builder's **Preferences** dialog. You can open this dialog with the **Options | Preferences** command.

More

When you click the **More** button, then the **More Settings** dialog pops up. Here you can choose if you want to change tool versions, edit document texts or if you want to work with the page setup. See Section 3.6.3.3, More Settings Dialog.

3.6.5.2 Options | Assign Double-click

Use this command (always available) to assign the mouse double-click.



Node List

● Function Chart Builder
○ Node Structure Function Chart Builder
○ On-line Builder
○ Text Editor
○ Extended View Dialog

Figure 3-46. Assign the Mouse Double-click Dialog

You can use this dialog to define different functions when double-clicking the mouse on an object.

Click **OK** to save the settings. The **Apply** button is not supported.

Dialog Controls

Node List

Click on the **Node List** tab and select the corresponding option to assign the function for double-click on a node in the **Node List**.

Circuit List

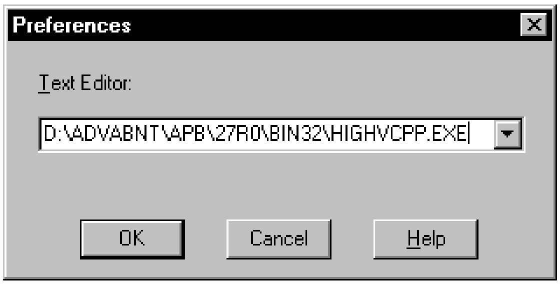
Click on the **CI List** tab and select the corresponding option to assign the function for double-click on a circuit in the **Circuit List**.

Type Circuit List

Click on the **TC List** tab and select the corresponding option to assign the function for double-click on a type circuit in the **Type Circuit List**.

3.6.5.3 Options | Preferences

Use this command (always available) to specify the preferred editor.



Text Editor: D:\ADVABNT\APB\27R0\BIN32\HIGHVCPP.EXE

Figure 3-47. Preferences Dialog

In the **Preferences** dialog, you can enter the name and location of a preferred editor, or you can select an editor from the list box.

The specified editor will be started when you use the **Tools | Text Editor** command, or when you start the text editor from the **Extended View** dialogs. The list holds all editors, which were specified there before, so you can switch between them easily.

The text editor AS100-EDIT is the default editor and is recommended to use, because you can use the standard document texts.

3.6.5.4 Options | Confirmation

This menu item is checked by default (with a check mark ✓).

So that you get a warning message when you start for example an older Function Chart Builder version than the newest installed version for a specific node type.

When the menu item is unchecked, the warning is not displayed.

The menu item is checked automatically when you install a new Function Chart Builder version.

3.6.6 Tools Menu

3.6.6.1 Tools | Function Chart Builder

Use this command to start Function Chart Builder.
The **Tools | Function Chart Builder** command is available if a single node, circuit, or type circuit is selected and a Function Chart Builder is installed for this node type. You can start Function Chart Builder only once.

See Section 1.8.2.2, Function Chart Builder and the *Function Chart Builder User's Guide* for more information.

Shortcuts

Toolbar:

Keys: CTRL+F

3.6.6.2 Tools | Node Structure Function Chart Builder

Use this command to start Node Structure Function Chart Builder.
The **Tools | Node Structure Function Chart Builder** command is available if a single node is selected and a Function Chart Builder is installed for this node type. You can start the Function Chart Builder only once.

The **Tools | Node Structure Function Chart Builder** command starts the Function Chart Builder in a special engineering mode. In this mode you can work with circuits corresponding to the function-oriented project engineering method.

See Section 1.8.2.2, Function Chart Builder and the *Function Chart Builder User's Guide* for more information.

Shortcuts

Toolbar:

Keys: CTRL+T

3.6.6.3 Tools | Bus Configuration Builder

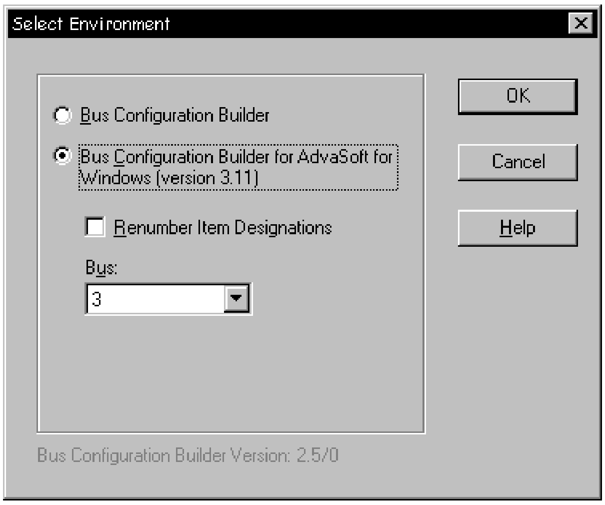
Use this command to start the Bus Configuration Builder. This command is available in the following cases:

- If the **Node List** is open
- If the **Node List** is open and contains nodes with a node type, which requires a bus and station definition
- If a project is open.

With the Bus Configuration Builder you generate configuration data for AdvaSoft for Windows and other Human-Machine Interface systems.

See Section 1.8.2.3, Bus Configuration Builder and the *Bus Configuration Builder User's Guide* for more information.

When you click the menu item **Tools | Bus Configuration Builder** the **Select Environment** dialog pops up. In this dialog, select the environment you want to work in.



Select Environment

○ Bus Configuration Builder

● Bus Configuration Builder for AdvaSoft for Windows (version 3.11)

☐ Renumber Item Designations

Bus: 3

Bus Configuration Builder Version: 2.5/0

Figure 3-48. Select Environment Dialog

When you click the **OK** button, the Bus Configuration Builder starts up.

Shortcuts

Toolbar:

Keys: CTRL+G

Dialog Controls

Bus Configuration Builder

Select this button to start the Bus Configuration Builder to configure Advant OPC Server for AF 100 and thereby Human-Machine Interfaces other than AdvaSoft for Windows based on Windows 3.11. This button is available in the Windows NT based version of Application Builder.

Bus Configuration Builder for AdvaSoft for Windows (version 3.11)

Select this button if you want to start the Bus Configuration Builder which collects data for AdvaSoft for Windows based on Windows 3.11. This Bus Configuration Builder generates source code for data set communication elements. This data can be used by Function Chart Builder for user specific configuration of AdvaSoft for Windows.

Renumber Item Designations

The item designations of DAT and DS elements will be renumbered in order to have unique item designations available for the man machine interface.

Bus

If a node is selected in the **Node List** with a bus number, then this bus number is the default entry in the bus list. The list contains all busses of the open project.

Bus Configuration Builder Version

Always the latest Bus Configuration Builder version related to that Application Builder will be started. If there is no related version available, an earlier version will be used. You can start a specific version via its shortcut in the **Start | Advant | Engineering** folder.

See Section 1.8.2.3, Bus Configuration Builder and the *Bus Configuration Builder User's Guide* for more information.

3.6.6.4 Tools | On-line Builder

Use this command to start On-line Builder. The **Tools | On-line Builder** command is available if a single node is selected and not an AC 100 Series node type (or derivations of them).
You can start the On-line Builder only once.

See Section 1.8.2.4, On-line Builder, *On-line Builder User's Guide* and the *On-line Builder Reference Manual* for more information.

Shortcuts

Toolbar:
Keys: CTRL+B

3.6.6.5 Tools | Text Editor

Use this command to start up a text editor. AS100-EDIT is the default editor. Use the **Options | Preferences** command to select an editor of your choice. The **Tools | Text Editor** command is available if a single node, circuit, or type circuit is selected.

You can start the editor on files in general representation (8-bit ANSI) or on files in ABB Master representation (7-bit ASCII). All conversions will be done internally. See Section 3.6.3.26, File | Convert for more information about file conversions and formats.

See also Section 1.8.2.5, AS100-EDIT and Section 3.5.14, Using the Text Editor.

Shortcuts

Toolbar:
Keys: CTRL+E

3.6.7 Window Menu

3.6.7.1 Window | Cascade

Use this command to arrange multiple opened windows in an overlapped fashion.

3.6.7.2 Window | Tile Horizontally

Use this command to vertically arrange multiple opened windows in a non-overlapped fashion.

3.6.7.3 Window | Tile Vertically

Use this command to arrange multiple opened windows side by side.

3.6.7.4 Window | Arrange Icons

Use this command to arrange the icons for minimized windows at the bottom of the main window. If there is an open document window at the bottom of the main window, then some or all of the icons may not be visible because they will be underneath this document window.

3.6.7.5 Window | 1, 2, ... (Activate List Window)

Use this command to activate the document window listed with number 1, 2, ... at the bottom of the Window menu. They are generally the list windows: **Node List**, **Circuit List**, and **Type Circuit List** window.

3.6.8 Help Menu

3.6.8.1 Help | Contents

Use this command to display the **Help Topics** window of the Application Builder Help.

Its **Contents** tab lists the available “how to”-type and reference information on the Application Builder. The information is hierarchically ordered.

Click on the book symbols 📕 to open them (📖) and on help topic symbols ? to jump to final topics of interest.

In the **Application Builder 2.* - Help** window you can click the **Contents** button whenever you want to return to the **Help Topics** window.

Here, use the **Index** tab to search for topics containing a keyword and the **Find** tab for full text search.

Shortcut

Toolbar: ?

3.6.8.2 Help | On Context

Use this command (always available) to obtain help on some portion of Application Builder. The mouse pointer changes to an arrow and question mark.

Click on an element of the Application Builder windows, such as a command in a menu, a toolbar button, or a dialog box.

The topic containing help information about this element will be shown in the **Application Builder 2.* - Help** window.

Shortcuts

Toolbar: ↖?

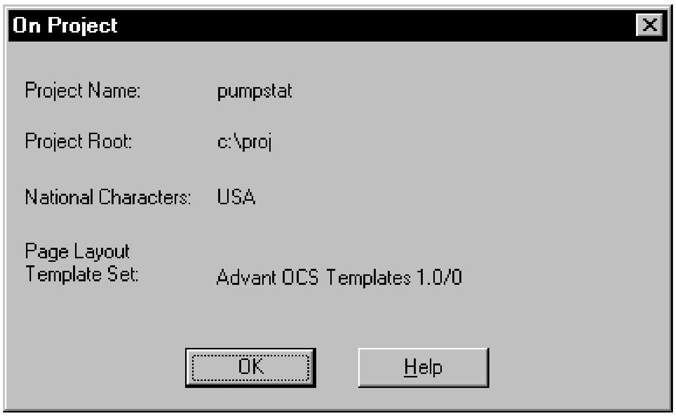
Keys: SHIFT+F1

3.6.8.3 Help | How to Use Help

Use this command for instructions about using help.

3.6.8.4 Help | On Project

Use this command to display some information about the project, like project root, project name, page layout template set, and national characters. This information is not available in other dialogs.



Project Name: pumpstat
Project Root: c:\proj
National Characters: USA
Page Layout Template Set: Advant OCS Templates 1.0/0

Figure 3-49. On Project Dialog

This command is available if a project is open.

Dialog Controls

Project Name

The name of the open project.

Project Root

The project root of the current project.

National Characters

The national characters used for this project. This setting cannot be changed. It is selected when creating a project.

Page Layout Template Set

The page layout templates set used for this project. It is selected when creating a project, and cannot be changed. See Section 3.5.2, Usage of Page Layout Templates for a description.

3.6.8.5 Help | Release Notes

Use this command to open the Application Builder Release Notes containing the following:

- General information on the Application Builder version, compatibility, and related documentation
- New Functions, improvements, discontinued and replaced functions of the Application Builder version; fixed or known problems, restrictions, and recommendations
- Installation and un-installation of the Application Builder version; upgrading, backup, and restoration of application data.

NOTE

The Release Notes is a *.PDF file. To read it, you need Acrobat Reader installed on the engineering station and the extension PDF associated with the Acrobat Reader. Acrobat Reader is a free product of Adobe Systems Inc.

3.6.8.6 Help | About Application Builder

Use this command (always available) to display the copyright notice and version number of your copy of Application Builder.

Chapter 4 Runtime Operation

4.1 Operating Overview

Not applicable.

4.2 Runtime Tutorial

Not applicable.

4.3 Operating Instructions

Not applicable.

4.4 Runtime Operating Menus

Not applicable.

Chapter 5 Maintenance

5.1 Error Messages

Not applicable here.

5.2 Handling of Diskettes

Diskettes must always be handled with good care. They should be well protected against dust. Dust can lead to serious malfunctions by damaging the faces of the diskettes, making them unreadable. The following rules should be observed when handling diskettes:

- Never touch the exposed diskette surface showing in the gap for the magnetic head.
- Never bend or fold a diskette.
- Never place a diskette in the proximity of a strong magnetic field (for example monitor).
- Always store diskettes in boxes.
- Store the diskettes in an environment with a temperature ranging from 50 - 125F (+10°C to +50°C), and with a relative humidity which does not exceed 80%.
- Do not expose the diskettes to strong sunlight.

Exercise caution when inserting diskettes into the diskette units. Always remove the diskettes from the diskette units before turning off the main power switch.

Appendix A National Characters

A.1 Introduction

To ensure compatibility between the tools and to display nation-specific characters (national language characters) of the Swedish and the German languages, a special mapping of characters is used. The US character set is the standard character set.

When using the Swedish character set, the following characters of the standard character set are not available: “[”,“\”,“]”,“{”,“|”,“}”.

When using the German character set, the following characters of the standard character set are not available: “[”,“\”,“]”,“{”,“|”,“}”,“~”.

On-line Builder uses the ABB Master representation (7-bit character), which does not contain national language characters. Function Chart Builder uses the general representation (8-bit ANSI).

You can specify the national characters when you create a new Project (see Section 3.6.3.1, File | New | Project).

A.2 US/Default Character Set

When using the function **Convert Source Code Files** (from general representation to ABB Master representation), or the function **Extract and Convert PC Source Code**:

> All characters from ASCII 32 to ASCII 127 remain unchanged, but all characters between ASCII 128 and ASCII 255 are mapped to ASCII 46, which is a dot.

When using the function **Convert Source Code Files** (from ABB Master representation to general representation):

> All characters from ASCII 32 to ASCII 127 remain unchanged.

A.3 Swedish Character Set

In addition to the standard characters (but without "[","\","]","{","|","}"), the following characters are supported:

Table A-1. Supported Swedish Characters

	ASCII Code Representations	
Supported Characters	**On-line Builder**	**Function Chart Builder**
Ä	**91**	**196**
Ö	**92**	**214**
Å	**93**	**197**
ä	**123**	**228**
ö	**124**	**246**
å	**125**	**229**

When using the function **Convert Source Code Files** (from general representation to ABB Master representation), or the function **Extract and Convert PC Source Code**:

- All characters from ASCII 32 to ASCII 127 remain unchanged, except those characters of Table A-1 in column "Function Chart Builder"; they will be changed to the corresponding codes in column "On-line Builder".
- All characters between ASCII 128 and ASCII 255 are mapped to ASCII 46, which is a dot (period).

When using the function **Convert Source Code Files** (from ABB Master representation to general representation):

All characters from ASCII 32 to ASCII 127 remain unchanged, except those characters of Table A-1 in column "On-line Builder"; they will be changed to the corresponding codes in column "Function Chart Builder".

A.4 German Character Set

In addition to the standard characters (but without “[”,“\”,“]”,“{”,“|”,“}”,“~”), the following characters are supported:

Table A-2. Supported German Characters

	ASCII Code Representations	
Supported Characters	**On-line Builder**	**Function Chart Builder**
Ä	**91**	**196**
Ö	**92**	**214**
Ü	**93**	**220**
ä	**123**	**228**
ö	**124**	**246**
ü	**125**	**252**
ß	**126**	**223**

When using the function **Convert Source Code Files** (from general representation to ABB Master representation), or the function **Extract and Convert PC Source Code**:

- All characters from ASCII 32 to ASCII 127 remain unchanged, except those characters of Table A-1 in column “Function Chart Builder”; they will be changed to the corresponding codes in column “On-line Builder”.
- All characters between ASCII 128 and ASCII 255 are mapped to ASCII 46, which is a dot.

When using the function **Convert Source Code Files** (from ABB Master representation to general representation):

> All characters from ASCII 32 to ASCII 127 remain unchanged, except those characters of Table A-1 in column “On-line Builder”; they will be changed to the corresponding codes in column “Function Chart Builder”.

Appendix B Glossary

ABB Master Representation

Way of representing and computing AMPL source code in On-line Builder (7-bit character).

Advant Controller

Computerized process control systems manufactured by ABB.

AMPL Source Code

ABB Master Programming Language. Uses text format to specify data base and process control programs for Advant Controllers.

Application Data

All data belonging to an entity as project, node, circuit, and type circuit.

Application Program

A general concept of an assembly of program functions aiming to realize and to automate an addressed process control functions. Contains of a data base and a PC part. The PC part (process control part) may be structured into different PC programs.

Base Software

The base software is the necessary software of a node type.

Bus

Identifies together with “station” a controller in a process control network.

Check Box

A little square box with a label on the right side which can be checked and unchecked.

Circuit

A functional piece of software that runs on the control system and is assigned to a process device. Circuits are the basic object of function-oriented project engineering.

Convert

A procedure to transfer source code files from ABB Master representation (7-bit character) to general representation (8-bit ANSI or ISO88591) and vice versa.

Data Base

Contains all information concerning connections to the hardware (I/O modules, signals, and so on), connections between PC programs (DAT elements) and connections to the man machine interface.

DB

An abbreviation for data base.

DBDATA

Directory to store data base files and is used mainly by Function Chart Builder.

DB Source Code

Data base part of AMPL source code.

Document Texts

Footer texts for documents as source code lists or general project documentation. Different footer styles are available.

Document Window

The window that gives view on the document data. More than one document windows can be open at the same time.

Extract

Is a procedure to extract a part of a PC program and write it into a new file. In addition the output file will be converted into ABB Master representation (7-bit source code).
The source code (*.AAX) is transferred from the PCDATA to the SRCE directory of the same node and changes the file extension to "*.AA" of the given output file name.

General Representation

Way of representing and computing AMPL source code in Function Chart Builder (8-bit ANSI or ISO88591).

Lock

To prevent access on an object by other users. A locked object is indicated by an "L" or an "l".

MasterPiece

Computerized process control systems manufactured by ABB.

National Characters

Set of characters, to ensure compatibility between the tools and to display nation-specific characters (national language characters) of the Swedish and the German languages.
The US character set is the standard character set.

Net

Identifies together with "Node" a controller or process station a process control network.

Node

Physically, a node is a process station of a process control network. The final target of application programs prepared by the Function Chart Builder is a (physical) node, that is, an Advant Controller or a MasterPiece.

Identifies together with "Net" a controller or process station in a process control network.

Node Structure

The location list for a certain process station. The Function Chart Builder supports the creation and code generation of node structures. A node structure consists of located circuits, symbol value assignments and also of glue logic, such as instructions creating or modifying DB elements and PC elements, even instantiated type circuits.

The node structure is an aspect of the node, which emphasizes the structure of the node and references the located circuits and instantiated type circuits rather than containing them with full contents.

Node Type

Stands for controllers, operator stations, an engineering station, or process stations. Each node type has a specific version, which is named behind the node type name.

Object

Can be a node, a circuit, or a type circuit.

ODB

All data entered via the Function Chart Builder for a node, node structure, circuit, or type circuit are stored internally in binary representation in files with the extension ODB.

Options

Extend the base software functionality of a node type.

PC

An abbreviation for process control.

PCDATA

Directory to store PC program files and is used mainly by Function Chart Builder.

PC Program

A process control program.

PC Source Code

Process control part of AMPL source code.

Position

Position identifies the position of the CPU module in the rack for certain node types.

Project

An environment for programming a process control system covering several Advant Controller or MasterPiece nodes.

Project Defaults

Are defaults, valid for one project: default node types, default comments, default parts of node names, and so on.

Project Root

A directory to store all data of projects.

RNet, RNode

RNet	is the remote network number of an RCOM network or a dial-up line using the RCOM protocol.
RNode	is the remote node in the RCOM network or a dial-up line.

Source Code

Short for AMPL source code.

SRCE

Directory used mainly by On-line Builder. Important files on this directory are source code files (ABB Master representation 7-bit character) and dump files.

Station

Identifies together with “Bus” a controller in a process control network.

Target System

A physical location in an Advant Controller or MasterPiece process control network.
A target or (physical) node usually contains an intelligent device like an Advant Controller or a MasterPiece.

TCDATA

Directory to store type circuit files and is used mainly by Function Chart Builder.

Tool Version

Each tool of AMPL Control Configuration a version is assigned to. Different versions of AMPL Control Configuration tools may be installed on the same engineering station.

Type Circuit

A standard solution for a special process control problem, usually well tested and documented. The Function Chart Builder supports the creation, code generation and instantiating of type circuits. A type circuit consists of symbol declarations, instructions creating or modifying DB elements, and PC elements. A type circuit can be instantiated several times within a node, node structure, or circuit. By assigning different values to its parameters at instantiating, you vary the function of each type circuit instance.

Unlock

The opposite of “lock”.

USER

Directory used mainly by On-line Builder.

INDEX

A

ABB Master representation A-1
About Application Builder 3-89
Activate List Window 3-87
Advant Controller 100 Series 1-7
Advant Controller 400 Series 1-7
Advant OCS 1-7
Advant Station 100 Series Engineering Stations 1-7
Advant Station 500 Series Operator Stations 1-8
AMPL Control Configuration 1-8
Application Builder 1-8
Arrange Icons 3-87
AS100-EDIT 1-14
Assign Double-click 3-82
Available Options 3-35

B

Base Software 3-34
Bold strings 1-5
Bus Configuration Builder 1-12, 3-84

C

Cascade 3-86
Circuit
    Modify 3-60
    New 3-40
Circuit List
    Open 3-45
Circuits
    Copy 3-51
    Extended View for 3-25
Close Project 3-78
Command syntax 1-5
Communication interfaces 1-3
Concatenate 3-73
Confirmation 3-83
Contents 3-87
Continuation files 3-74
Conventions 1-5
Convert 3-67
Copy
    Circuits 3-51
    From... To... dialog 3-50
    Nodes 3-48
    Projects 3-46
    Type Circuits 3-53

D

Default
    Character Set A-1
Defaults 3-80
Delete
    Project 3-55
    Selected 3-56
Document Texts 3-39
Double-click 3-82
DSPU131 1-2 to 1-3

E

Edit Document Texts 3-39
Editor 3-86
Engineering Board 1-2, 1-7
Engineering Station 1-7
Enter key 1-5
Equipment Requirements 1-2
Exit 3-78
Expansion slot 1-3 to 1-4
Extend 3-78
Extended View for
    Circuits 3-25
    Nodes 3-20
    Type Circuits 3-30
Extract 3-70

F

Function Chart Builder 1-10, 3-84

G

General representation A-1
German Character Set A-3

H

Handling of Diskettes 5-1
Hardware 1-1
Host Personal Computer 1-8
How to Use Help 3-88

I

I/O space 1-3
Indicator
    L 3-7, 3-17, 3-19, 3-24, 3-29
    l 3-7, 3-17, 3-19, 3-24, 3-29
    W 3-17

Ini files 3-18
Installation 2-1
Italic strings 1-5

K

Keyboard interaction 1-5

L

L indicator 3-7, 3-17, 3-19, 3-24, 3-29
Lock/Unlock 3-56
Locking 3-7, 3-17

M

Maintenance 5-1
Memory 1-3
Memory space 1-3
Modify
    Circuit 3-60
    Node 3-57
    Type Circuit 3-60
More Settings dialog 3-36

N

National Characters 3-32, A-1
Navigation 3-2
New
    Circuit 3-40
    Node 3-33
    Project 3-31
    Type Circuit 3-42
Node
    Modify 3-57
    New 3-33
Node List
    Open 3-45
Node Structure Function Chart Builder 3-84
Node Type 3-34
Nodes
    Copy 3-48
    Extended View for 3-20

O

On Context 3-87
On Project 3-88
On-line Builder 1-12, 3-86
On-line Manuals 1-14
Open
    Circuit List 3-45
    Node List 3-45
    Project 3-44
    Type Circuit List 3-45
Options 3-35

P

Page Setup 3-77
Parallel Execution 3-7
Power requirements
    Engineering Board 1-3
Preferences 3-83
Print 3-75
Print Preview 3-76
Project
    Copy 3-46
    Delete 3-55
    New 3-31
    Open 3-44
Project Defaults 3-80
Project Notes 3-78
Project Root 3-32
PU516 1-2 to 1-3

R

RAM 1-3
Related Documentation 1-6
Release History 1-6
Release Notes 3-89
Remote Net, Node 3-34
Requirements 1-2
Restrictions on Parallel Execution 3-7

S

Select Tool Versions 3-37
Setup 2-1
Slots 1-3 to 1-4
Split Source Code 3-72
Status Bar 3-80
Swedish Character Set A-2
Syntax 1-5

T

Target systems 1-2
Terminology 1-7
Text Editor 3-86
Tile Horizontally 3-86
Tile Vertically 3-87
Tool Versions 3-37
Toolbar 3-79
Type Circuit
    Modify 3-60
    New 3-42
Type Circuit List
    Open 3-45
Type Circuits
    Copy 3-53
    Extended View for 3-30

U

Update 3-79
US Character Set A-1
Used Versions 3-79
User Interface 1-18

V

Versions 1-1
    Working with different 3-4
View
    Names Only 3-79
    Used Versions 3-79

W

W indicator 3-17

3BSE 007 031R701

November 1999